Magic Land design and the use of interactive tabletops in non-directive play therapy with primary school children: to play or not to play?

Magic Land design and the use of interactive tabletops in non-directive play therapy with primary school children: to play or not to play?

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DECLARATION

I hereby certify that this thesis is based on my original work except for quotations and citations, which have been duly acknowledged. I also declare that it has not been previously or currently submitted for any other degree at the University of Newcastle or other institutions.

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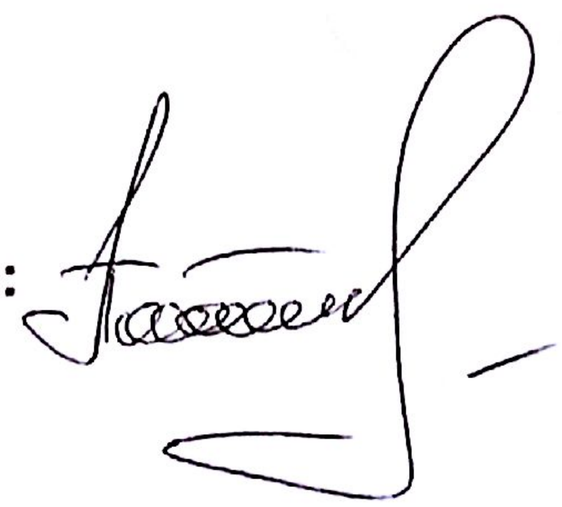
Signature: 

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ABSTRACT

This research considers the role and design of digital technologies in play therapy settings with young children. Through an aggregation of academic and practitioner literature, and the results of focus group and individual interviews with therapists and counsellors, a set of design requirements for digital technologies that support non-directive play within a play therapy context is proposed. The study explores how these complex requirements could support non-directive play therapy principles through the development and evaluation of Magic Land, a set of four play therapy applications for an interactive tabletop. On the basis of the qualitative research evidence, it is suggested that the design guidelines should be deeply rooted in the theoretical foundations of non-directive play therapy and reflect a number of psychoanalytic and child social development theories. The concepts developed in two opposing schools of thought by Piaget and Vygotsky are used to guide the design and map the research findings. Taking into account the children's interest in technology, the therapists' skills, the affordances of the technology and the design guidelines aligned with the core theories of play therapy, it was found that the Magic Land application on an interactive tabletop could support such non-directive play therapy principles as the development of a trusting therapeutic relationship, a child's creative expression and the gradual nature of the therapeutic process. It created opportunities for children to practise exercising a feeling of mastery and taking the initiative, as well as allowing for joyful and non-goal oriented free play.

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DEDICATION

To the curious creative child who lives in all of us

PUBLICATIONS

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~ Forest Witcraft

CHAPTER 1. INTRODUCTION

'Intelligence - not because you think you know everything without questioning, but rather because you question everything you think you know'
~ Anonymous

1.1 Introduction

Mental health is essential to sustaining satisfying relationships, as well as self-awareness and resilience to personal and relational setbacks. For children and young people, good mental health also enables them to take part in educational and social activities as well as maintain positive self-esteem (Aviles et al., 2006)

Given benefits associated with good mental health, there is concern that children in particular are experiencing greater levels of mental health problems (UN Convention, 1991). This is of particular concern since it has been established that anxiety and depression in childhood are precursors to depression in adulthood (Fryers, 2007; Wals & Verhulst, 2005). Mental health problems are also a significant societal challenge. For example, over 90% of young offenders in the UK have had a mental health problem as a child (Facing the Future, 2000). Taken together, these facts confirm the need to promote children's well-being as well as the need for therapeutic interventions specifically designed for children.

Play therapy is one therapeutic approach currently used with young children. According to Piaget's cognitive theory (Piaget, 1962) and Bowlby's attachment theory of child development (Wilson & Ryan, 2005), play gives children the opportunity to gain an understanding of confusing feelings and situations that give rise to them by replaying these situations in a safe environment. Play also empowers children to explore alternative, more appealing or desirable, outcomes (Wilson & Ryan, 2005). Play therapy is especially appropriate for children aged between 3-12 (Landreth, 2002; Sallman,

2007) who use play as their language to express thoughts and feelings (Wilson & Refson, 2007).

Digital technology is a familiar medium in children's lives. Video games and virtual reality applications in particular have already been successfully deployed in psychotherapy to treat a range of anxiety, panic disorders and phobias (Coyle & Doherty, 2009). Yet, despite the potential suitability of technology for therapies with older children, digital technologies are largely absent in therapies for young children. This is especially surprising given the importance of intervening in mental health problems at as young an age as possible (Hatch, 2009).

Interactive tabletops constitute a new generation of digital technology that allows for direct interaction through a horizontal multi-touch surface. They have been used to promote children's fantasy play (Mansor et al., 2009), storytelling (Cao et al., 2010), creativity (Marco, 2009), and collaborative interaction (Rick et al., 2011). Although play therapy is based upon these elements, little research has been conducted into how these activities could be used within the therapeutic framework with children. Such frameworks would suggest that a child’s play is deeply therapeutic when there is a working relationship with a therapist and a breaking down of defences providing therapeutic release. The question becomes: how do we design applications that can support these therapeutic facets of play?

Play therapy practices at the moment remain embedded in traditional toys, representative objects and other creative materials, largely chosen by the therapist. Moreover, some therapists are reluctant to bring digital elements into therapy sessions. They consider that technology interferes with the therapeutic process since it has the potential to exclude the therapist from the therapeutic alliance with the child if a one-user centred digital system is introduced into the playroom (Carmichael, 2006). Furthermore, since technology may not always be sturdy enough for continuous play, some are also concerned about the frustration and disappointment digital toys can cause the vulnerable child in therapy (Ryan & Jaeger, 2009).

Therefore, this section introduces the reader to the present research by exploring mental health and emotional well-being and its prevalence at both national and international levels. Play therapy intervention and its importance for young children are established in more detail further. The purpose of introducing technology in play therapy, aims and research questions are outlined and the contribution of the study is summarised.

1.2 Setting the scene: international and national contexts

This subsection establishes the research context for the present study. The meaning of emotional well-being and mental health as well as their importance for an individual's development are discussed first. The statistics relating to the mental health situation in the UK and worldwide are reviewed. It is argued that, given the present need for promoting mental health and emotional well being, it is at the young age when the relevant intervention should be introduced.

1.2.1 Definition of emotional well-being and mental health

In the literature there is no agreed definition of well-being and it is often referred to simply as a state of being in which an individual is reasonably satisfying to his or her self (Cummins & Nistico, 2001), 'a state of emotional or social well-being in which an individual can cope with the normal stresses of life…' (World Health Organisation, 2014), and 'the balance between social, physical, spiritual and emotional aspects of life' (UNON, Joint Medical Service, 2014). The description of psychological well-being, also, includes emotional, behavioural, social and cognitive attributes of well-being (World Health Organisation, 2014).

Children and young people in their turn define the latter as an ability to 'feel in control' or 'feeling balanced' (Children's Society report, 2010). In addition, it can also mean an absence of mental disorders such as anxiety, panic, obsessive-compulsive or post-traumatic stress disorder, to name but a few. Mental health and well-being are not always about being happy all the time but

rather about being equipped with the social skills necessary to develop and sustain satisfying relationships and empathy, and such abilities as self-awareness and resilience so that it is possible to enjoy one's own company and deal successfully with the setbacks we all face at times (CAMHS, 2008). For children and young people this means taking part in educative and social activities and having positive self-esteem. In addition, being mentally healthy means children can play, learn, and develop a sense of right and wrong (Children's Society report, 2010)

1.2.2 The importance of mental health and well-being in childhood

The importance of the population's mental health can hardly be overestimated. For society to function and develop, the psychological well-being of all the individuals that make up that society is essential. As Carrl puts it, 'mental health is fundamental to overall health and is the foundation for learning, thinking, communicating, self-esteem, and resilience, as well as successful functioning in one's work, family, community, and society' (Carrl, 2003, p.1). It is not a new fact that children and young people who are suffering from emotional problems are less likely to enjoy and achieve in their lives (Every Child Matters, 2004; A School Report Card, 2008; The Children's Society Report, 2014).

As mentioned above, given the benefits associated with good mental health, there is concern that children in particular are experiencing greater levels of mental health problems (United Nations Convention on the Rights of the Child, 1991; Mental Health Foundation, 2014), and this is of particular concern since it is accepted that anxiety and depression in childhood are precursors to depression in adulthood (Fryers, 2007; Wals & Verhulst, 2005). Mental health problems are also a significant societal challenge. For example, over 90% of young offenders have had a mental health problem as a child (Mental Health of Children and Adolescents in Great Britain in 'Facing the future', 2010). Furthermore, according to a Healthy Lives, Brighter Future Report (2009), half of those who had mental health problems at the age of 26 were first identified as having a psychiatric disorder at the age of 15, and nearly 75% by their late teens. In addition, it is estimated that 80% of children who exhibit behavioural problems at the age of five develop more serious forms of anti-social behaviour

in the future if not treated properly (Mental Health of Children and Adolescents in Great Britain in 'Facing the future', 2010).

Therefore, good health for children and young people is essential because, as stated in the strategy for children and young people's health 'Healthy lives, brighter futures' (2009, p.14), 'it enables them to make the best of their opportunities in education and in developing healthy lifestyles'. It is the basis for better personal health and well-being in adulthood and prerequisite for enabling people to make a full contribution to the wider society, which in turn helps to alleviate poverty, deprivation and joblessness (Department of Health, 2014). The mental health of children and young people is the foundation of their happiness and well-being, as well as the keystone for further healthy growth as successful individuals who can fully contribute to the society.

1.2.3 Estimates of the prevalence of children's well-being

Having shown in the previous section the importance of good mental health and well-being at an early age, this section establishes the need for therapeutic interventions with children through reviewing the latest statistics on the prevalence of children's well-being worldwide, and especially in the UK where this research originated. It is estimated that approximately 450 million people worldwide have a mental health problem (World Health Organisation, 2001), with 1 in 4 British adults experiencing at least one diagnosable mental health problem in any one year, and 1 in 6 who suffer from this type of problem at any given time (The Office for National Statistics Psychiatric Morbidity Report, 2001; The Mental Health Foundation, 2007).

In the UK an increasing number of children are experiencing mental health problems. For example, in 1999, boys were more likely to have a mental disorder than girls, and this was evident in both the 5 to 10 years age group (10% of boys and 6% of girls) (Office for National Statistics, 1999). 10% of children aged between 5-15 experience clinically defined mental health problems in 2001 (Promoting Children's Mental Health within Early Years and School Settings, 2001). In 2004, in the UK around 10% of 10 to 16 year olds had a diagnosable mental health disorder and around 7.5% of children between 5 to

10 years old had various disorders (Office of National Statistics, 2004). Around 1 in 8 children suffered bullying in 2011-2012 (Office for National Statistics, 2014). The Depression Report (2006) suggests that costs of mental health in the UK might be as high as £77 billion. According to the Office for National Statistics Mental Health in Children and Young People in Great Britain, in 2005 one in ten children had a mental health disorder. 10% of 5-16 year olds had a diagnosable mental health disorder (Green, McGinnity, Meltzer, Ford, & Goodman, 2005). In 2007, one in ten children had clinically significant mental health difficulties (anxiety, depression etc.) and conduct disorders (uncontrollable or destructive behaviour) (The Children's Society, 2007). A study conducted by Bradshaw and Richardson (2009) revealed significant differences in the well-being of children across 29 European countries, with the UK being the 24th in 2009 and the 16th in 2013 (Office of UNICEF Research, 2013) of all the countries in terms of children's overall well-being.

In addition, it is not only clinical mental health issues that children suffer from. As research by the National Society for the Prevention of Cruelty to Children (NSPCC) reveals, a third of children are worried about something and half of them experience the stress of not having anyone to talk to (Featherstone & Evans, 2004), which can further develop into emotional disorders (The Office of National Statistics, 2008). Interestingly, according to the United Nations Children's Fund (UNICEF, 2007) report on child well-being in 21 rich countries, which was assessed under six different dimensions, the assumption that 'the wealthier the country the healthier, happier and safer children are' is not the case in reality. For example, the Czech Republic, achieved a higher overall rank for children's well-being than several much wealthier countries including France, Austria, the United States and the United Kingdom. Among the factors that influence children's well-being and mental health are: living apart from your father, family conflict, poor mental health of parents, and absence of a stable family life or stable friendships (The Children's Society, 2007; Department of Health, 2014). School, education, learning, the local environment, community, money, attitudes and health also contribute to a child's well-being (Rees et al., 2010). Therefore, even children in economically developed countries, including the UK, suffer emotional difficulties in addition to clinical mental health issues.

The above figures and previous research looking into children's well-being (Moore et al., 1993) thus establish the need for children's well-being and the promotion of mental health as well as the need for therapeutic interventions for children.

1.2.4 International and national policies that promote children's well-being

The need for therapeutic interventions for children has been established in the previous subsection. This section reviews both national and international policies that reflect the need to promote children's mental health and well-being.

There are a number of global and national policies and programmes targeted especially at the promotion of children and young people's mental health and well-being. The world's leading organisation, the United Nations International Children's Fund (UNICEF), works in more than 190 countries worldwide with its representation in the UK (UNICEF UK). It was created to protect and promote the rights of all children to health, childhood, education etc. In addition, the United Nations Convention on the Rights of the Child (UNCRC), the document through which the organisation is guided, stresses children's rights to be 'as healthy as possible' (UNICEF, 2010).

Further, the UK National Service Framework for Children, Young People and Maternity Services, developed on the basis of a UNCRC programme, emphasises the importance of the mental health and psychological well-being of children and young people, and also the need of the latter 'to have access to timely, integrated, high quality multidisciplinary mental health services to ensure effective assessment, treatment and support, for them, and their families' (National Service Framework for Children, Young People and Maternity Services, 2004: Standard 9; The Children's Society, 2014). Also, the document advocates a shift from not simply treating the illness or the problem to the taking of preventive actions so that children can stay healthy, both physically and mentally, in order to reach their full potential.

The same agenda in terms of promoting children's mental health and well-being is set out in the document 'Every Child Matters' (2004), which details the support that the UK government will provide for the implementation of the National Service Framework for Children, Young People and Maternity Services. The growing importance that the government is attaching to health and well-being, is also reflected in the Children's Plan, in which an entire chapter focuses on how to ensure the well-being and health of children. The enhancement of '...children and young people's wellbeing, particularly at key transition points in their lives' is one of the main goals for 2020 established by the Children's Plan (The Children's Plan, 2007, p.14).

There is also a strategy for children and young people's health - 'Healthy Lives, Brighter Futures' (2009) - which sets out the government's objectives and commitments in terms of promoting children's well-being and mental health. The Child and Adolescent Mental Health Services (CAMHS) Review of 2008 and NHS CAMHS Tier 4 Report (2014), which aimed to discover how children's health, education and social care services impact on the mental health and psychological well-being of children and young people, highlighted the need to understand the causes of children's mental health problems and ways of dealing with them.

This opinion is echoed in The Good Childhood Inquiry (2009) as well as in NHS CAMHS Tier 4 Report, which recommend more psychological support for children and young people. Health was emphasised as being among the key policy priorities for 2009-2011 by the 'Speaking Out' project, a joint project between the National Council for Voluntary Youth Services (NCVYS) and Children England (an organisation for children, young people and families in the voluntary sector). Moreover, public health guidance on promoting the social and emotional well-being of children aged 4-11 in primary education was produced by the National Institute for Health and Clinical Excellence (NICE) on behalf of the Department of Health (Promoting children's social and emotional well-being in primary education, 2008).

The above paragraphs have reviewed the policies and documents that have established children's mental health and well-being as 'a national priority' (Speaking Out Briefing No.22, 2009, p. 5) and that further support the need for early interventions to promote children's mental health and well-being presented in the previous section.

1.2.5 Play therapy as an early intervention for children

It was argued in the previous sections that there is a pressing need for early therapeutic interventions to support children's mental health and emotional well-being. This section gives an overview of play therapy, a therapeutic intervention specifically aimed at children. It will be explored in more detail in Chapter 2, section 2.3.

Play therapy is defined as a form of self-therapy for children by means of which confusion, anxieties and conflicts are worked through (Hall et al., 2002). Since children's language development lags behind their emotional and abstract abilities to conceptualise the world in which they live (Carmichael, 2006), toys and other manipulative tangibles are used in play therapy as a way of helping children to communicate their ideas and emotions. Play therapy is especially appropriate for children aged between 3-12 (Landreth, 2002; Sallman, 2007) who use play as their language to express thoughts and feelings (Wilson & Refson, 2007). It can be used with all children to help them modify their behaviour, clarify self-concepts and build healthy relationships. In simple terms we can think of it as being equivalent to counselling for adults (Pykhtina et al., 2012).

1.3 Rationale for the study

In section 1.2 the terms 'mental health' and 'emotional well-being' were defined, and it was argued that both mental health and emotional well-being are of great importance, especially in childhood. Further, the prevalence of children's mental health and well-being both worldwide and in the UK was discussed, as well as the policies that have identified children's emotional well-being as a priority and thus established the need for early interventions with children. Play therapy was presented as a commonly used therapeutic

intervention that supports children suffering from emotional distress and/or mental health problems. This section explores children's familiarity with technology and its importance in their lives, as well as its use in a therapeutic context with children, including the play therapy arena. It also presents a new generation of computers - interactive tabletops - and outlines their potential for use in play therapy practice. Finally, my own motivation and personal interests to undertake the present research are presented.

1.3.1 Children, technology and play therapy

Digital technology is a familiar medium in children's lives. It is employed for both educational and entertainment purposes. In addition, technology has been used to support mental health and well-being in therapeutic contexts. For example, video games and virtual reality applications in particular have been successfully deployed in psychotherapy to treat a range of anxiety and panic disorders and phobias (Coyle & Doherty, 2009). Yet, despite the potential suitability of technology in therapies with older children, digital technologies are largely absent in therapies for young children. This is especially surprising given the importance of intervening in mental health problems at as young an age as possible.

Play therapy practices at the moment remain embedded in traditional toys, representative objects and other creative materials, largely chosen by the therapist (discussed in more detail in Chapter 2, section 2.5.5). Moreover, as stated above, some therapists are reluctant to bring digital elements into therapy sessions. They consider that technology may interfere with the therapeutic process since the introduction of a one-user centred digital system into the playroom has the potential to exclude the therapist from' or 'prevent the therapist from building the therapeutic alliance with the child. Furthermore, since technology may not always be sturdy enough for continuous play, there are concerns about the frustration and disappointment digital toys can cause the vulnerable child in therapy (Carmichael, 2006). However, children increasingly request access to game consoles and other digital devices in the play therapy room (Rydel, 2011), which suggests that trying to keep digital technologies out of the play therapy setting is unrealistic and will ultimately be counterproductive.

1.3.2 Why interactive tabletops?

Interactive tabletops constitute a new generation of digital technology that allows for direct interaction through a horizontal multi-touch surface. Unlike the traditional one-user computer, interactive tabletops allow for face-to-face interaction and multi-user play at the same time. They have been used to promote children's fantasy play (Mansor et al., 2009), storytelling (Cao et al., 2010), creativity (Marco et al., 2009), and collaborative interaction (Rick et al., 2011), the elements play therapy is based upon. Moreover, children are becoming more and more familiar with such multi-touch technology as ipads, iphones and DS devices, which work on the same principle as interactive tabletops. Therefore, it is logical to propose exploring the potential suitability of interactive tabletops in the play therapy room as a tool for therapists and as a familiar medium of expression for children.

1.3.3 Personal reasons to undertake this piece of research

I have always been passionate about working with children. At the time when I began this PhD project I had already obtained several degrees and a vast experience in the teaching sphere. Interestingly, as I was teaching English to refugees and asylum seekers in the UK, I found myself more engaged in providing emotional support and help with dealing with difficult trauma and abuse related emotions than teaching practices. It is then when I started thinking of adding another side to my teaching career – a qualification in counseling. Since my educational background was not sufficient for a PhD in counseling, I decided to start an Integrated PhD course which allowed me to gain subject specific knowledge, resulting in 200 credits from the appropriate modules. Although being familiar with child development theories and child psychology from a number of courses I took during my BA study, I still needed to acquire more knowledge about the atypical development of children.

Therefore, I was enrolled in and successfully completed a course offered by a Canadian Association for Child and Play Therapy. I was awarded Play Therapy Certificates covering levels I, II and III. Following the completion of the course, I did a1.5-year placement with the UK child counseling organisation

Place2Be in one of the primary schools in the north of England. Further, since a part of the present research is concerned with the design processes in the field of Human-Computer Interaction, I also had to take training in the design methods offered by Culture Lab, Newcastle University. I worked closely with several researchers and program developers from the Culture Lab (Gavin Wood, John Shearer, Ahmed Kharuffa & Madeline Balaam), who offered me valuable feedback and support in dealing with the technical part of the project. Also, during this time I attended academic conferences and presented papers, as well as participating in continuous professional development workshops offered by Place2Be.

My notes during the research reflected my worries about undertaking this study as a novice play therapist. My main concern at the beginning of the study was that I did not have enough practical therapeutic experience to conduct this research. As the study progressed, I realised that in order to conduct this research I needed the research skills that I had gained while doing my MA more than my years of practice in play therapy. In addition, I noticed that even experienced therapists were not always certain about their ideas and understanding since they had never used this piece of technology in their work before. There were therapists who had worked for years with traditional toys and at times they struggled to imagine how to work with a digital toy in their room. In this sense, being new to therapy had its own advantages: it allowed me to approach this topic with understanding but with an open mind, free from any bias concerning the use of technology in play therapy.

1.4 Purpose of the study and research questions

The importance of technology and its familiarity in children's lives was outlined in the previous section. It was argued that a new generation of computers, interactive tabletops, could be suitable for play therapy with children. This section presents the purpose of the study and the research questions.

The purpose of this study was to explore the potential of the interactive tabletop as a digital toy within non-directive play therapy for a young audience

(aged between 4-11). The features of interactive tabletops, unlike those of traditional computers, may give them the potential not only to fit into the therapy room, but also to become a play platform that supports the principles of non-directive play therapy. The aims of this research, therefore, were as follows:

(i) to explore the possibilities of an application design on an interactive tabletop for use in non-directive play therapy;

(ii) to establish the basis for understanding how, if at all, the designed application on an interactive tabletop can support non-directive play therapy principles.

The research questions were formulated as follows:

1) *How, if at all, could an application on an interactive tabletop be designed to suit the non-directive play therapy framework?*

2) *How, if at all, could a novel digital toy like Magic Land on an interactive tabletop support non-directive play therapy?*

1.5 Interdisciplinary research: where Play Therapy and Human-Computer Interaction meet

The main aim of the study was to determine how novel interactive tabletop technology could support non-directive play therapy (NDPT). Since there are few computerised toys specifically designed for a NDPT context (Giusti et al., 2011; Hancock et al., 2010), it would not be possible to carry out the research without first designing a digital toy for an interactive tabletop. Therefore, although the researcher approached this study as a therapist and positions herself in the play therapy field, the design processes (including the development research methodology discussed later in Chapter 3) represent a large part of the present study. It could be argued that in order to understand the application of the toy and its relevance to therapy, one must know what properties this toy possesses.

Moreover, if the toy has been newly designed, it is crucial to know why the designer created it in that particular way and how the design decisions, if at all, guide the use of that toy. Therefore, it will be helpful for the reader to bear in mind the fact that, although this piece of work originated in the field of play therapy and was written mainly for therapists who work with children, its nature is symbiotic, combining the interaction design and play therapy fields. It is my deep belief that only by understanding the full picture can one grasp the complexity and challenges of the current study as well as its implications for the theory and practice of non-directive play therapy.

1.5.1 Multidisciplinary research: where is the boundary?

When I approached this study as a play therapist, I had no knowledge of or skills in programming computer software. As a result, my second supervisor, Prof. Patrick Olivier, suggested that I work with a game developer called Gavin Wood who was a member of the newly established iLab: Learn, in the School of Education, Communication and Language Sciences, Newcastle University. iLab: Learn is a laboratory for developing digital technology applications appropriate for use in education. It hosts multidisciplinary research in the fields of education, counselling and computing science. It is a practice-based research lab with working Technology Enhanced Learning installations, including multi-touch and pen-based tabletops, a Self-Organised Learning Environment (SOLE), Mobile Learning devices and an instrumented digital kitchen for task-based language learning.

My collaboration with the programmer included discussions of my ideas and the production of paper-based copies of the software that I designed and produced to communicate my ideas and requirements for the implementation of the software. Based on the literature review and interview data with therapists, I outlined the required options and functions as well as finding the images and pictures that were to be included in the application. Also, having reviewed each of the produced software prototypes with therapists and children, I provided Gavin with a list of the changes needed to improve the program at the end of each iterative cycle.

Having had a great deal of experience in game development, Gavin had many valuable ideas of his own. However, being aware that one of the requirements of a PhD is that the work be individual, I focused on the suggestions and ideas that I outlined from the play therapy literature and the research participants' interviews. Therefore, only these ideas were included in the software design, which resulted in Gavin's bringing my vision to life by programming my outlined requirements into a working system.

1.6 Ethical considerations

Since the study was carried out with children of primary school age who suffer from emotional and behavioural issues, ethical approval from Newcastle University as well as the written consent of parents and therapists were obtained following the ethical research guidelines of Newcastle University (see Chapter 3 for full details). The data were kept anonymous and safely stored on an e-drive specially obtained from the ECLS department in a password-protected computer on campus.

1.7 Outline of the study

Following the design and development guidelines for mental health technologies, the study adopted a five-phase approach sensitive to the ethical issues surrounding the design of applications for mental health interventions (Doherty et al., 2010): (i) design; (ii) interface usability tests; (iii) mock-therapy sessions; (iv) pilot study; (v) a real world deployment.

1.8 Value and contribution of the study

As initially argued, there is a shortage of exploratory studies on the use of technology and interactive tabletops in play therapy with primary school children. As a result, the development of design guidelines and the qualitative study of the use of the designed software contained in this research represent a much needed contribution to our understanding of how digital toys could be designed on interactive tabletops and their potential value for non-directive play therapy with children. In addition, this is one of the first studies that has taken on the

challenge to introduce technology in non-directive play therapy and to investigate its possible support of non-directive play therapy principles. It is among the first studies that combine theories of child cognitive development (Piaget, 1952), psychoanalytic theories of Bowlby (1980) and Erikson (1959) and socio-cultural theory of Vygotsky (1978) to guide the design and investigate the use of the newly designed digital toy. The study, therefore, makes contributions to both interaction design in Computing Science and the Play Therapy field. The findings establish the basis of understanding how digital toys on an interactive tabletop fit with non-directive play therapy and healthy child development.

CHAPTER 2. LITERATURE REVIEW

'You can discover more about a person in an hour of play than in a year of conversation'.
~ Plato Greek philosopher (427–347 BC)

2.1 Introduction

This piece of work is positioned in two areas: Play Therapy and Human-Computer Interaction; the literature review therefore consists of three parts. Part 1 explores concepts of play and therapy, the functions of play therapy and the origin of and approaches to play therapy. It focuses on the various theories of child development and argues the relevance of the theories of Piaget (1952), Bowlby (1980) and Erikson (1950) for non-directive play therapy. Part 2 concentrates on Computer Interaction Design research into the use of digital technology in the field of mental health. The part continues with a review of the benefits of and concerns regarding the use of technology with children. Interactive tabletops are then introduced, with a discussion of their origin, features and use in research as well as in educational and therapeutic practice. It is also shown how the theories of Bandura (1977) and Vygotsky (1978) were used to underpin the theoretical framework behind the use of an interactive tabletop in this research.

Finally, in Part 3 the differences and similarities between those theories upon which non-directive play therapy and the use of interactive tabletops are built are examined. The opposing views of Piaget (play therapy) and Vygotsky (interactive tabletops) are critically discussed. It is also shown how the theories of Piaget (1952), Vygotsky (1978), Bowlby (1980) and Erikson (1950) can help understand the context of non-directive play therapy as well as how they guided the current research. The chapter concludes by demonstrating the complexity of and interrelations among those various views in the context of NDPT. It is argued that the framework designed for this research that includes all these perspectives offers an opportunity to understand the value of NDPT for children's cognitive and emotional development. The potential benefits of

interactive tabletops for use in play therapy as a result of their particular features and affordances are examined.

2.2 Part 1: Play & Play Therapy

For those who are not familiar with play therapy concepts, it should be pointed out that when this intervention is first mentioned it often happens that the emphasis is placed on the word ‘play’ and not on the word ‘therapy’. Play and play therapy, although they have similar basic functions, are very different in purpose and thus, the rules and outcomes of play in each case are different. Therefore, before examining concepts of play therapy and the differences between play therapy and play, one needs to understand what the latter is. In the following sections, therefore, play is defined, and its functions and theoretical foundations are reviewed. The concept of and approaches to play therapy are presented next. This is followed by clarifications of the terms ‘play therapy’ and ‘therapeutic play’, which are often used interchangeably, but which do not necessarily have the same meaning.

2.2.1 What is play?

This section explores the term ‘play’, the characteristics of play and the role it performs in physical, emotional, social, cognitive and language development. It also outlines the theoretical foundations of play, including classical and contemporary theories, and the advocates and foundations of these theories. It further discusses how through play children develop motor skills, and learn social norms, self-control and cultural rules. Play is presented as a way of establishing relationships with the world and of relating to past experiences in a safe environment.

There appears to be no single definition of what constitutes play. As early as 1950, Erikson (p. 214) stated that ‘play is a function of the ego, an attempt to synchronize the bodily and social processes with the self’, and this definition is still the one most quoted. Many (Hutt, 1970; Weisler & McCall, 1976) agree with the view that play is a pleasurable experience. According to Hughes (1995), in addition to giving pleasure, play also implies intrinsic motivation, free

choice, non-linearity and active engagement. This is in line with the six characteristics of play identified by Rubin et al. (1983) who defined play as something that is intrinsically motivated and self-satisfying. It is an activity in which attention is paid to the means rather than to the ends; it should not produce commodities (see also Bruner, 1972; Landreth, 1991; Piaget, 1962).

Another characteristic of play identified by Rubin et al. (1983) is that the orientation and course of the play follows children's interests. The children include the questions they are asking themselves and the things they are curious about. The difference between instrumental behaviours and play (the pretence) is the make-believe nature of play, where children are free from imposed external rules and may act as they please. Finally, Rubin et al. emphasise the importance of children's active participation in the activity as the last characteristic of play. In addition to those characteristics, Rubin et al. (1983) also distinguished between the physical, emotional, social, cognitive and language developmental aspects of play. These aspects are reflected in a number of child development theories, an overview of which is presented later on in section 2.5.3.

2.2.2 Functions of play

Once it is understood what play is, it seems reasonable to ask what play brings into a child's life? What functions, or purpose, if any, does it perform? Many theories have been developed over the years regarding the development and purpose of play (Lundberg, 2004). These can be divided into two main categories: classical and contemporary.

The so-called '*classical theory*' focuses on the biogenetic significance of play, identifying the latter as 'an instinctive mechanism that either promoted optimal physical development or reflected the evolutionary history of the human species' (Hughes, 1995, p.16). Within this category, theories explain play as a way to discharge (Spencer, 1873) or renew (Patrick, 1916) natural energy. Advocates of theories within this category believed that play was designed to re-live periods in the evolutionary history of the human species (Hughes, 1995), and that play developed the skills and knowledge necessary for adult life (Groos,

1901). It includes the psychoanalytic perspectives of Sigmund Freud and Anna Freud (discussed in more detail in section 2.3.2), and the focus on play as a way of reducing children's anxiety by giving them control over the world and an acceptable way to express forbidden impulses.

The so-called '*contemporary theories*', including Jerome Bruner (1972) and Brian Sutton-Smith (1967), recognised play as being principally a means of providing a comfortable and relaxed atmosphere in which children can learn to solve problems (Hughes, 1995).

In addition to these two broad categories, it is also argued that play has more functions than those described above. As a result, O'Connor's (2000) classification of all functions of play seems to present a wider but more detailed and useful framework for understanding play functions which he divided into four main groups: biological/cognitive; intrapersonal; interpersonal, and socio-cultural.

Biologically speaking, the function of play is to develop motor skills, improve hand-eye coordination and increase muscle mass (O'Connor, 2000). From a cognitive point of view, play has been shown to have positive effects on memory (Saltz, Dixon & Johnson, 1977), attention (McCune & Zanes, 2001) and language (Creasey, Jarvis & Berk, 1998). On an intrapersonal level, play satisfies children's need to do something, as well as giving them an opportunity to explore their environment and learn social norms. Self-control and self-esteem can also be developed through interaction (Rubin, et al., 1978).

Further, a sense of self can be developed through play, as it allows the child to separate him or herself from the care-giver (Erikson, 1959). Role-play contributes to the development of empathy by giving children the opportunity to experience feelings and emotions from another person's point of view (Chalmers & Townsend, 1990; Upright, 2002). Play allows children to learn about their culture, which in turn has an impact on types of play activity and the type of behaviour engaged in during games since they are influenced by the society and

the socioeconomic environment they are being brought up in (Roopnarine, Johnson & Hooper, 1994).

In addition to the above functions of play, the well known American play therapist Garry Landreth (2002) adds that play is a way for a child to establish a relationship between his/her self and the world. Through building up this relationship the child acquires and masters various skills (problem-solving, coping etc.) in his/her own way. When the child has gained the necessary confidence he/she can learn other tasks and accept less agreeable patterns (Landreth, 2002). By giving children the opportunity repeatedly to rehearse life situations and to create their own life space within the outside world, play contributes to the process of personality development. Moreover, in play children relate themselves to their past experiences by constantly reorienting themselves to the present (Landreth, 2002). Through play children make attempts to resolve their inner conflicts and problems with outside world. All these play activities allow children to rediscover their selves and to revise their own self-image and the relations between them and the world.

The discussion in this section has shown that play is defined as a natural process of bringing together bodily and social processes and the self. It is a pleasurable, motivating, non-linear activity based on free choice and active engagement, with attention being paid to process rather than to outcome. There are various opinions about the original purpose of play (Hughes, 1995; Lundberg, 2004): whether it is a way of disposing of or renewing energy or releasing anxiety (Spencer, 1873; Patrick, 1916). It is, however, agreed that play performs essential biological, cognitive, intra/interpersonal and socio-cultural functions in children's lives (O'Connor, 2000).

2.2.3 What is play therapy?

In the previous section, definitions and the functions and characteristics of play were presented. In this section the focus is on the definition and functions of play therapy and the contrast between play therapy and the notion

of mere ‘play’. I discuss several approaches to play therapy, and I explore the ways in which play therapy is different from or similar to therapeutic play.

To grasp the meaning of play therapy from the perspective of play alone might be problematic, as a child who replays a variation of traumatic events in play therapy session is far from having fun and is unlikely to be deriving much pleasure from it (O’Connor, 2000). A child undertaking a play therapy session, unlike a child who is just playing, might even be fearful and tense from the beginning. It is the goal of the therapy to create ‘an opportunity [for a child] to 'play out' his feelings and problems just as, in certain types of adult therapy, an individual 'talks out' his difficulties (Axline, 1947).

Play therapy is thus defined as an interpersonal process in which a child is being helped by a therapist to deal with his or her emotional problems and traumas (Hall, Kaduson & Schaefer, 2002). It is also defined as a form of self-therapy for children through which confusion, anxieties and conflicts are worked through (West, 1992). The wording of the term might differ but what is common to all definitions is the idea that play therapy as a process helps children to understand their muddled and upsetting feelings caused by different events that they have not had a chance to sort out properly (British Association of Play Therapists, 2014).

The following definition given by the British Association of Play Therapists (2014) seems to encapsulate most of the views of what play therapy is and is therefore the definition used in this piece or work:

‘Play Therapy is the dynamic process between child and play therapist in which the child explores at his or her own pace and with his or her own agenda those issues, past and current, conscious and unconscious, that are affecting the child’s life in the present. The child’s inner resources are enabled by the therapeutic alliance to bring about growth and change. Play Therapy is child-centred, in which play is the primary medium and speech is the secondary medium.’

It is important to note, however, that play therapy is not just the traditional play of a child being observed by an adult. As Mulherin (2001) puts it, for play to be beneficial from a therapeutic point of view, it should include opportunities for diagnostic assessment; a working relationship with the therapist; a breaking down of defences; the facilitation of articulation; the provision of therapeutic release, and the preparation of children for future life events. This can be achieved in many different ways depending on the play therapy approach and its underlying theoretical framework (discussed in the following section).

The reason why play is suitable as a form of child therapy is because young children frequently have difficulty not just in sitting still, which is required in therapy sessions with adults, but also in verbalising their feelings. Through play, children may reveal what is worrying them and play out stresses and traumas, which can give them mastery over the latter and equip them with new coping skills (Porter et al., 2007; Ray, 2006). In addition, play makes use of non-verbal symbols and is one of the main ways through which children develop understanding, explore conflicts and rehearse emotional and social skills (Wilson & Ryan, 2005). As some note (Gil, 1991; Landreth; 2002; Schaefer, 1993), play therapy is especially appropriate for children aged 3-12 years old. It has proved to be effective as a psychological intervention for young children under 10 years of age. One of the possible reasons for this could be that play is a safe means for young children to communicate their feelings without having to verbalise and discuss complex issues and emotions (Porter et al., 2007).

2.2.4 Play therapy approaches and historical roots

As seen in the previous section, play therapy is not simply play being observed by an adult. Although a child can still benefit from the basic functions of play (biological, cognitive etc.) that were discussed earlier in section 2.2.2, play can be therapeutic only when both child and therapist follow a theory of therapy. In other words, for play to become play therapy, the child has to work with a therapist who introduces ‘rules’ for play which vary depending on the theoretical approach to play therapy within which the therapist is practising.

Major approaches to play therapy are based on Anna Freud and Melanie Klein's development of their psychoanalytic sessions with children through play. Other approaches were developed from various schools of adult therapy: Jungian, Gestalt and Adlerian. In addition, some creative therapies, such as world technique, sand tray therapy, narrative play therapy and art therapy, have been introduced into play therapy. Relationship and filial/group play therapies differ from other play therapies in terms of the principles on which they are based and the ways in which the therapy is conducted. It is difficult to provide a clear-cut definition of all these approaches, since some seem to have been grounded within a firm theoretical frame with the provision of organised training and interventions, while others have emerged as additional approaches that are more practical but which lack their own theoretical principles. Therefore, in this section only the major approaches to play therapy: psychoanalytic, structural, cognitive-behavioural and non-directive (or child-centred) play therapy, are reviewed.

Psychoanalytical Approach. Child play therapy dates back to 1903 when the Austrian neurologist and founder of psychoanalysis Sigmund Freud outlined the stages of childhood instinctual development (oral, anal and genital) and attempted to apply psychotherapy with a young boy, Hans, through his father. It was not until 1919, however, that play was first incorporated into therapy, when Hug-Hellmuth proposed using it as an essential part of a child's analysis (Hug-Hellmuth, 1921).

It was not until the late 1920s and early 1930s when the pioneers of child psychotherapy Anna Freud and Melanie Klein wrote extensively on how the traditional psychoanalytical technique was adapted by them into play therapy for use with children (O'Connor, 2002). Since children do not possess enough skills to express themselves verbally, it is not surprising that verbal free association techniques, which were extensively used with adults, were replaced by play for children as the source of information on their thoughts and feelings (Bratton et al., 2005). The innovative aspect of this therapy was seeing the therapist as an observer who would help a child verbalise the elements of play, offering interpretations and communicating the wishes and desires expressed by the

children through their play back to them verbally. Through the introduction of this innovation, Anna Freud and Melanie Klein contributed greatly to the development of play therapy in terms of acknowledging the therapeutic value of play for a child and exploring ways of developing play therapy within the psychoanalytical tradition, thus laying the groundwork for modern play therapy approaches.

Structured/Focused Approach. Between the late 1930s and the 1950s various child therapy theories and techniques started emerging (O'Connor, 2002). Although there were differences between them, they were all developed within the psychoanalytical framework, and they all acknowledged the therapeutic value of play and the role of the therapist in determining the focus and direction of the therapy.

One example of focused therapy is 'release' or 'structured' therapy developed by Levy (1938). This is a type of goal-oriented play therapy for use with children suffering from specific traumatic events. It was based on Sigmund Freud's idea of repetition compulsion, a psychological phenomenon in which a person repeats traumatic events over and over again. Levy believed that in a secure and supportive environment and provided with the right materials, a child could replay the traumatic event until he/she is able to deal with the negative thoughts and feelings associated with it. The materials offered should be carefully chosen and limited by the therapist to those which will be most cathartic with relation to the event being replayed.

Cognitive-Behavioural Approach. This type of therapy is based on the view that a person's behaviour is learned and purposive. Pioneered by Beck (1964), the goal of cognitive-behavioural play therapy is to develop coping skills in order to change negative behaviour into more positive and desirable behaviour through verbal communication with the therapist. This approach is considered to be the most effective for children aged between 2.5 and 6 years, and especially for treating separation anxiety (Porter et al., 2007). In this type of play therapy, the therapist usually becomes the voice to express the child's fears and to model adaptive coping skills for the child.

Humanistic/Non-directive approach. Quite a different viewpoint on child play therapy from that of psychoanalysis emerged in the 1940s, when Carl Rogers, an influential American psychologist, developed a humanistic approach to psychology through establishing a new model of psychotherapy – client-centred therapy (later known as person-centred therapy). As non-directive play therapy provided the main theoretical foundation for this study, before exploring this approach further in section 2.5, this section focuses on describing the basic foundations of the humanistic psychology from which non-directive play therapy was developed.

One of the main assumptions of humanistic psychologists is that each individual has his or her own particular subjective way of viewing the world. In other words, they believe that each person experiences, perceives and understands the world in his or her own unique way. Therefore, in order to make sense of people's actions you need to know how they understand the world and what it means to them specifically. Moreover, according to humanistic psychologists, even though they may not realise it, people have free will and a choice about the actions they take. In addition, all people are believed to have a tendency towards growth and the fulfilment of their potential.

The idea of achieving one's full potential is closely linked to Abraham Maslow's (1943) human needs hierarchy, which are presented in a figure in the form of a pyramid. Thus, the needs on the bottom level are physiological needs; above these is the need for safety, followed by the needs for belonging and esteem, with the need for self-actualisation at the top. Rogers (1951) believed that the achievement of self-actualisation or of one's full potential is only possible if one has a basic positive view of the self (positive self-regard), which is only possible when one has the unconditional positive regard of others (the feeling of being valued and respected without reservation by those around one).

The problem that arises when an individual does not have an unconditional positive regard of self and others is that he or she becomes dependent on external conditions of worth (e.g. experiencing the feeling of being

valued only when passing an exam with the highest marks). Rogers (1951) argued that this leads to an incongruity between the real self (how one is) and the ideal self (how one should be) and to the individual's desire to close this gap. Therefore, the humanistic approach can be seen as more beneficial than more traditional psychoanalytical diagnostic perspectives that involve the continuous analysis of the client since it emphasises genuineness, acceptance and trust between the client and therapist, so tha the latter is in no way evaluating, analysing or judging the former. Unlike the psychoanalytic approach that offers the client interpretations and answers, the therapist's role within a humanistic approach is to listen and understand the situation from the clients' perspectives, to enable them to find their own answers at their own pace. The client/therapist relationship becomes the core factor in therapeutic change and the client's growth and self-actualisation as an individual (Rogers, 1951).

The humanistic approach seems to be more applicable for use with children, since their incomplete development does not allow for the cognitive processing of a therapist's comments necessary in psychoanalysis. Further, it can be argued that to enable a child's emotional and cognitive growth, trust and acceptance are more useful than judgement or interpretation. Finally, since it is one of the most widely used approaches in the UK and Canada (where this research was conducted) non-directive play therapy was the focus of this research, and is reviewed in more detail in section 2.5.

2.2.5 Therapeutic factors of play

Like ordinary play, play in a therapeutic context also performs certain functions, regardless of the approach to play therapy adopted. Some of these functions are more evident in some play therapy models than in others (e.g., problem solving functions are more evident in cognitive-behavioural than in non-directive therapy), but they can all be found within each model to some degree. Schaefer (1993, p.6) outlines fourteen features of play and the benefits produced by each feature for the child:

1) Overcoming resistance (play helps to establish rapport and alliance with a child)

2) Communication (play acts as the most natural medium of self-expression and communication)
3) Mastery of environment (a sense of power and control can be developed through play)
4) Creative thinking (improvement in problem-solving skills, promotion of creativity and flexibility through play)
5) Catharsis (the arousal and discharge of strong positive and negative emotions for therapeutic relief)
6) Abreaction (the process of reliving past events and emotions which are stressful and negative)
7) Role-play (play allows children to try out alternative behaviours and to obtain a reflected view of their identity from the perspective of other identities)
8) Fantasy (play gives children opportunities to learn about themselves and enlarge their world, as well as to experience power and control over the world and their own environment)
9) Metaphoric teaching (myths are used to reshape beliefs and explore the meaning of life)
10) Attachment formation (is achieved through replicating the positive parent-infant relationship through sensor-motor play: e.g., touch and smiles)
11) Relationship enhancement (a positive relationship is facilitated through fun-filled interactions that focus on enjoyment rather than achievement)
12) Enjoyment/Positive Emotion
13) Mastering developmental fears (could be achieved through systematic desensitisation – the process of being exposed to fearful stimuli in a safe environment)
14) Game play (contributes to children's cognitive, social and emotional development and allows them to see the immediate consequences of their actions, which in turn assists in developing a sense of internal locus of control)

In spite of the fact that the above therapeutic factors are beneficial for children and aid in change, they do not necessarily constitute change during the therapeutic process. As Sallman (2007, p.10) puts it, it is the therapists' interventions and relationship with the child that 'facilitate[s] and can augment the therapeutic factors'. He also suggests that the therapeutic factors of play can help the play therapist to understand the power of play and choose the appropriate therapeutic interventions.

In summary, this section has shown that, unlike mere play, the purpose of play therapy is to help children express and work through the issues they are struggling with. In order to do this, play therapy follows one of the many available approaches. The psychoanalytic, directive, focused and non-directive are the major approaches; however, there are many more approaches and techniques which are not reviewed in detail in this piece of work. Each approach differs from another depending on the beliefs concerning how therapy should be conducted (for example, in psychoanalysis interpretations of the play are offered to the child; in focused or cognitive-behavioural therapy the directions and focus come from the therapist, while non-directive therapy is based on the principle of child-led free play with no rules and a non-judgemental and accepting relationship). The common therapeutic functions of play have also been outlined and discussed in this section.

2.2.6 Play therapy versus therapeutic play

Having explored the difference between play and play therapy, it is also important to differentiate between play therapy and therapeutic play. These two terms are sometimes used interchangeably, but there is hardly any explanation of the origin or nature of the terms in the literature. The Play Therapy UK website is an exception to this rule; it describes therapeutic play as a way to improve the emotional well-being of a child through play and/or the creative arts (Play Therapy UK, 2013). However, it is emphasised that, unlike play therapy, therapeutic play can be used by a care worker or teaching assistant to treat minor emotional or psychological problems that are preventing a child from functioning well. It is not essential for someone to have a counselling or

psychotherapy background to use therapeutic play, but in order to treat severe problems it is crucial that the person be trained as a child psychotherapist. Clinical supervision is necessary in such a case according to the regulations governing therapeutic relationships. Therefore, therapeutic play can be used by someone who is not necessarily a trained child psychotherapist, while play therapy is a method used with children with sever problems by a specially trained coulsellor or psychologist (PTUK, 2010).

Another issue that needs to be clarified is the type of training and official accreditation of the therapist. In the UK two main providers of play therapy training, Play Therapy UK (PTUK) and the British Association of Play Therapists (BAPT), offer programmes at master's level for those who want to specialise in child play therapy. This is, however, not the only possible route to becoming a play therapist. There are many who were initially trained in adult counselling and psychotherapy who later wished to work with children. In this case, training organisations (such as Place2Be, UK) or professional associations (e.g., the British Association for Counselling and Psychotherapy, UK, or the Association for Child and Play Therapists in Canada) often offer short courses in play therapy as a part of continuous professional development. At the end of this training, counsellors usually get a certificate confirming their ability to use play therapy techniques with children. As these certificates are at a lower level than MA qualifications in play therapy, counsellors are often asked to refer to their training as therapeutic play rather than play therapy.

Since this issue is not discussed in the literature, and owing to the similarity of training in both routes, in this thesis both experienced counsellors who are trained in therapeutic play and therapists trained specifically in play therapy are referred to as 'play therapists'.

2.3 Non-directive (Child-centred) play therapy

The child-centred model of play therapy is based on the non-directive humanistic approach discussed in section 2.2.4. This section explores the origin and core principles of child-centred play therapy. As the aim of this study was to

design and evaluate an application on an interactive tabletop for use in non-directive play therapy, it is important to outline the theory of non-directive play therapy here, including the therapist's role, the objectives of therapy and the requirements for the play therapy room and play materials.

2.3.1 Origin and core principles of therapeutic change

This section starts by presenting the origin and principles of child-centred play therapy outlined by Virginia Axline (1947). Non-directive play therapy is based on the humanistic approach, which emerged in the 1940s in opposition to the psychoanalytic approach widely practised at that time. As mentioned in section 2.2.4, Carl Rogers established a new approach to psychology that was based on establishing a trusting, accepting and genuine relationship between therapist and client. Rogers believed that every person possessed inner wisdom and a desire for growth and self-healing, which can be achieved under the right conditions.

In response to this, Virginia Axline (1946) developed a new therapeutic approach for working with children – child-centred (also called non-directive) play therapy, which paralleled Rogers' beliefs about a person's capacity for self-healing and growth under the right conditions (Rogers, 1951). Axline believed that the therapist should recognise the feelings of the child and report them back to him in a manner that would give the child insights into his behaviour. It is not the task of the therapist to lead the child, but rather to give him the freedom to go his own way at his own pace. For such play therapy to be successful from Axline's perspective, the therapist's positive regard is crucial, as it is not the content of the session that makes the difference to children's emotional well-being but 'having someone constantly and consistently interested in their welfare' (Lebo, 1955, p. 182).

In 1947 Axline described the developed play therapy theory and method in her famous, truly intriguing book entitled 'Dibs: In Search of Self', about how she used play therapy with a young boy called Dibs (Axline, 1947). Axline's non-directive play therapy principles are still in use and much of current play therapy practice is based on those principles, which may be summarised as follows:

Principle 1: Develop a Warm and Friendly Relationship with a Child.

Principle 2: Respect a child's ability to solve his or her own problems and offer the opportunity to return responsibility to the child.

Principle 3: Do not direct but let the child lead.

Principle 4: Establish a feeling of permissiveness so that children are free to express their selves.

Principle 5: Do not hurry the counselling process but recognise the gradual nature of the therapeutic process.

Principle 6: Accept the child unconditionally.

Principle 7: Set only those limits, which are necessary to anchor the child's experiences in therapy to the real world.

Principle 8: Recognise and reflect the feelings of the child to create understanding for the latter.

Although non-directive play therapy aims to follow those principles, it is not goal-driven. There is no set objective for the child to achieve. A therapist is mainly concerned with the present - the 'here and now' - and the focus is on the therapeutic process of the child/therapist relationship (Axline, 1947). In such relationships, therapists give all their attention to the children without providing any interpretations of their play or giving them directives (Gil, 1994). Rapport is built through the trusting relationship between child and therapist, which creates a sense of security for the child and encourages him or her to discover his or her own solutions (Carmichael, 2006).

A child is not seen as someone who needs to be changed but rather as someone who is already good enough and needs to be accepted through

unconditional positive regard the way he/she is. This is the goal for the therapist - to return responsibility for and the direction of play to the child enabling them to lead the therapeutic process instead of follow the therapist's ideas of how the child's play should be progressing. This reflects the belief that a child is a thinking, independent, constructive human being who is capable of self-determination (Sallman, 2007). The acceptance of a child's attitudes, feelings and thoughts is also believed to help a child open up (Landreth, 1991) and discover his/her true feelings.

NDPT has also been criticised for a number of reasons. First, there are claims that it is not appropriate for children with trauma and attachment issues (as summarised in Van Fleet et al., 2010). Further, there are opinions that NDPT does not set boundaries and thus does not stop children's destructive behaviours (ibid). Van Fleet et al. (2010) argue, however, that such claims do not stand up, owing to the insufficiency of the research usually cited when making them or owing to dubious methodology. A lack of training in and practice of NDPT may also give rise to such conclusions. Indeed, Carmichael (2006) illustrates how NDPT can be used as a successful intervention with children who are suffering from behavioural conduct disorder. She argues that the NDPT principle of limit setting is what helps to keep the child safe in the room and assists with dealing with a child's challenging behaviour.

Another criticism of NDPT is that it might not be as efficient as other more directive approaches (e.g., Cognitive-Behavioural Intervention) for relaxation and desensitization (Carmichael, 2006) and in work with sexually abused children. In response to that, Ryan and Needham (2001) examined the case of a 9 year-old traumatized boy. They argue that short-term interventions for single-episode trauma 'seem viable and may be offered as alternatives to directive interventions' (Ryan & Needham, 2001, p.450). It is generally advised, however, that NDPT be combined with another intervention (Family Therapy or one of the directive approaches) (Van Fleet et al., 2010).

Finally, although NDPT is not necessarily a long-term therapy, it usually takes longer than directive approaches that focus on a quick solution. For

children to work through the process of exploring the playroom, aggressive play, regressive and other theme-related play, and mastery play, a minimum of 10 half-hour sessions is recommended (Van Fleet et al., 2010). Bratton et al. (2005) found that most non-directive play therapists averaged 22 sessions with their clients. Therefore, NDPT is also criticised for being less cost-effective. In addition, since NDPT therapists believe that therapy outcomes may not necessarily be seen immediately but that they are manifested over time, it is not easy to measure progress and track therapeutic changes in the long run. Despite this criticism, NDPT is one of the main approaches used successfully in the UK, for instance by the British Association of Play Therapy (BAPT) and Place2Be, the UK child counselling charity organisation, and in Canada by the Canadian Association for Child and Play Therapy (CACPT), to name but a few.

2.3.2 Child development theories in non-directive play therapy

For various reasons, non-directive play therapy as outlined by Axline, although widely read, failed to develop into a school of thought until recently (Ryan & Wilson, 2005). Some of the main reasons are (i) the incomplete realisation of the view of the personality and the place of play in the therapeutic process; (ii) the incomplete exploration of Rogerian psychotherapy upon which NDPT is based, and (iii) the lack of analysis of the function of play in the therapeutic process and its relationship to mental and emotional development (Ryan & Wilson, 2005). More recently, the practice and theoretical foundations of NDPT have been reviewed and updated. For instance, Wilson and Ryan (2005), who will be referred to frequently in this subsection as they were among the first to set NDPT in a broader framework of child development, excellently demonstrated that this play therapy approach derives its effectiveness and rationale from child cognitive, attachment, emotional and social development theories (Piaget, 1952; Bowlby, 1980; Erikson, 1963). Based on these child development theories, symbolic play, a creative environment and the therapeutic relationship are demonstrated to be the foundation of effective play therapy. This section explores these theories and discusses their relevance to non-directive play therapy principles and practice.

Theory of child cognitive development – Jean Piaget

The French-Swiss psychologist Jean Piaget (1896-1980) proposed a theory of child cognitive development consisting of four periods: (i) sensorimotor (birth to 2 years); (ii) preoperational (2 to 7 years); (iii) concrete operational (7 to 11 years), and (iv) formal operations (11 years to adulthood). Wilson and Ryan (2005) argue that Piaget's principles have a well-established research base focused on child's mental development. Also, these principles help in understanding children therapeutically in terms of atypical development.

Piaget (1952), adopting a biological perspective, proposed the concept of *schemas* or *organisations of mental structures* - representations in the mind of a set of perceptions, ideas and actions that constitute knowledge. He theoretically divided all mental structures into personal (connected with persons) and objective (related to objects) schemas. Further, he proposed that each schema had an affective (emotional), cognitive (thinking), and motor (physical) component developed during the stages described below.

The biologically oriented theory of Piaget states that all living organisms (including children), during their development, further their environmental *adaptation* (Piaget, 1952). The latter consists of two processes: assimilation and accommodation. When children take information from their environment and external people into their ongoing activities, they are going through a process of assimilation, or internalisation. When they adjust themselves to the surroundings, this is the process of accommodation. In other words, during assimilation, external information is internalised as symbols and assimilated into relevant schemas. During further interaction with their surroundings and other people, children may need to adjust the acquired knowledge and behaviour: that is, accommodate themselves to the environment. In the process of assimilation and accommodation, schemas are developed and transformed.

During the first stage, or *Sensorimotor period* (from birth to month one), schemas are biologically driven reflexes, such as grasping or sucking. In the

processes of assimilation and accommodation during the second stage (from 1 to 4 months) they become repetitive and stereotyped behaviours, which are called Primary Circular Reactions. These reactions further develop into Secondary Circular Reactions during stage three (4 to 10 months). In this stage, if the child is praised for some of the behaviours, this can result in positive re-enforcement (Roffer, 2006). During the next stage, between 10 and 12 months, the child develops an ability to activate two schemas to produce more coordinated behaviour in order to achieve a goal or perform a task. In stage five, between 12 and 18 months, the child learns how to produce new coordinated behaviours, Tertiary Circular Reactions, in order to achieve the same goal.

Finally, during stage six, children are capable of using their mental capacity to solve problems independently from the physical behaviours. Since the child is able to form mental representations, memorise and recall previous behaviours, he or she can mirror the behaviours seen earlier (this contributes to the process of deferred imitation). In this stage children can express their thoughts and feelings, mainly through motor activity such as play, because they have still not developed the necessary language capacity to express themselves fully verbally.

During the *Preoperational Period* (2-7y.o) children develop the capacity to play creatively, substituting one object for another. They learn to use language to represent objects by means of words and images as well as develop the ability to classify objects, but by a single feature only (e.g., the ability to group together rectangular blocks regardless of colour).

During the *Concrete Operational Period* (7-11 years) children start thinking logically about objects and events, as well as achieving understanding of number, mass and weight. In addition, they have the ability to classify objects according to several features and can order them in series along a single dimension such as size.

The *Formal Operational Period* (11 years and up) is marked by the child's developed capacity to employ deductive and inductive reasoning as well

as reflective abstraction. In this period concerns about the future, and about hypothetical and ideological problems can emerge. However, despite the fact that a much higher level of thinking and reasoning capabilities are being developed, the child's egocentric thinking can re-emerge, too. Children can feel that they are the centre of the universe and that everything revolves around them. In addition, the child starts thinking logically about abstract propositions and tests hypotheses systematically.

As well as taking into account the affective, cognitive and motor schemas developed during the stages described above, Wilson and Ryan (2005) use the evidence in current development research that social interactions are the core of our emotional lives to argue the need to include a social component within the emotional component of schemas. They further demonstrate the necessity to include perceptual (related to the senses) schemas and extend the motor component of a schema to include behavioural, bodily as well as motor features. Indeed, this clarification is important, since it is impossible to separate motor schemas from behaviours expressed on a bodily level.

Criticism of Piaget's theory

Piaget's theory is mainly criticised for having two major weaknesses: for an underestimation of children's intellectual abilities and for overlooking cultural effects (Wood, 2008; Edwards et al., 2000). Critics' main argument is that Piaget used confusing and abstract terms when describing the tasks to children. Also, the tasks themselves were considered to be overly difficult and inappropriate for the level of the children's development (ibid.). In addition, some believe that Piaget overlooked the effects of a child's cultural and social groups (Edwards et al., 2000), focusing solely on Western society and culture. Research suggests that Piaget's system may not reflect the facts accurately. It sometimes underestimates the abilities of children while overestimating them at other times (ibid.). Despite the criticisms made by some practitioners, however, an examination of Piaget's theory by others (Lefrancois, 2006) shows that his theory is consistent, coherent and comprehensive. In either case, it provides a basic framework for understanding the child's cognitive development.

Relevance to play therapy

Atypical development may occur when some of the mental organisations, or schemas, have not been sufficiently developed owing to environmental factors, such as a care-giver's absence or lack of appropriate stimulation. As Wilson and Ryan (2005) note, the affective and motor schemas of emotionally troubled children turning to therapy seem to be insufficiently mobile and flexible for optimal adaptation.

Since the child's mental organisations, or schemas, are developed in the process of assimilation and accommodation, which are abstract and highly symbolic in nature, symbolic play, on which play therapy is based, is an excellent tool for children to express their feelings and thus re-work the mobility of their schemas. Symbolic play allows children to externalise past experiences through play activities and language. In using imagery and speech together it is assumed that both the cognitive and the affective components of schemas will become integrated into children's mental structures at their current developmental level (Wilson & Ryan, 2005).

Symbolic play is especially important during the pre-operational and operational concrete periods when the child's experiences are stored as *abstract mental imagery*, which consists of memories and emotions that children can remember and recognise accurately before they are able to articulate these complex emotions and thoughts in language. During play therapy these images will be incorporated into children's play experiences, resulting in emotional insight into their troubling experiences, which may have altered their personal, affective schemas.

Since symbolic play has an important role to play in the therapeutic process, toys used as representations of child's feelings and thoughts are extremely important. The effectiveness of non-directive play therapy depends on whether 'play offers a stimulation environment for both intellectual and emotional creativity' (Newson & Newson, 1979, p. 12). Piaget (1962) stated that play is neither the behaviour per se, nor a type of activity. Play is determined by a certain orientation to behaviour (Piaget, 1962), and owing to this orientation, as

long as playfulness prevails, there is always a surprising element that exceeds a repetition or a habit (Erikson, 1977). Therefore, for children to re-integrate their past experiences and re-work schemas, play therapy has to offer a creative environment for frivolous free play as well as provide toys that are symbolic in nature and that can represent a variety of feelings and mental images (for further discussion of the toys, see section 2.3.5)

Attachment theory – John Bowlby

Another main body of developmental knowledge and research that has contributed to understanding children's emotional difficulties in play therapy is the Attachment Theory originated by the British psychologist, psychiatrist and psychoanalyst John Bowlby. He suggested that mental health and emotional problems are rooted in early childhood experiences. This theory is largely influenced by Ethnological theory that is concerned with the adaptive or survival value of behaviour in the process of evolution (Hinde, 1989). Based on this theory, Bowlby proposed that children are born biologically pre-programmed to form attachments with others to ensure survival (Bowlby, 1980). He defined attachment behaviours as instinctive, being activated by external conditions such as fear, separation and insecurity which lead to the development of a biological need between the infant and mother to stay in contact with each other.

The concept of monotropy, the child's ability to attach to one main attachment figure, is the first main principle in Bowlby's theory. He suggested that the primary bond is different from any other kind of bond, and that the failure to initiate or a breakdown of the maternal attachment are likely to result in negative consequences. If the attachment is not sustained continuously for the required period (especially during the first two years of a child's life), this may result in irreversible long-term consequences such as cognitive, social and emotional difficulties. In addition, it may cause delinquency, reduced intelligence, increased aggression, depression and even affectionless psychopathy (the inability to show affection or concern for others). Like Piaget, Bowlby suggested that the child's primary attachment leads to the development of an internal working model, which is defined as a cognitive framework of mental representations for understanding the world (schemas), the self and

others. Based on this internal model the child decides whether others are trustworthy, whether the self is valuable and effective when interacting with others. In other words, this internal model influences all future interactions and relationships and guides the child's future social and emotional behaviour (Bowlby, 1980).

Some developmental theorists (e.g., Schaffer & Emmerson, 1964) argued that Bowlby's work was focused exclusively on the child/mother bond, excluding the important role played by other significant carers such as grandparents, the father and siblings. Therefore, Bowlby was criticised for ignoring the possibility that children could develop a number of relationships and the potential for multiple bonds with significant people in their lives (ibid.). Also, Schaeffer and Emmerson (1964) suggested that it is not the intensity of the bond (as believed by Bowlby) but the sensitivity and quality of the time spent with the baby that contributes to the development of a strong bond between the two. Despite this criticism, it is evident that Bowlby's theory has strong relevance for therapeutic work with children, since it makes it possible to understand their emotional/social difficulties through the lens of the past and current difficulties they have experienced in the intimate relationships essential for healthy development (Wilson & Ryan, 2005). Although Bowlby's theory is based on the principles of psychoanalysis, it is also relevant to non-directive play therapy. Since a therapist can provide a different and positive relationship, instead of the disruptive and inconsistent relationship that the child might have had with the primary care-giver, the child/therapist relationship becomes the main vehicle for possible therapeutic change in non-directive play therapy. This is in line with Carl Rogers' ideas of self-healing under the conditions of positive unconditional regard, which are supplied by the therapist initially through the development of a warm and friendly relationship with the child.

In addition, the experience of a positive relationship can give children the safety to open up and explore the emotional issues and disturbing situations encountered on their terms at their pace. It is an opportunity for children, if they so wish and choose, to update the schemas and not only re-integrate their past experiences but also develop a new understanding of a satisfying, warm and

friendly relationship which they can project onto other people in their lives. Thus, Bowlby's theory of attachment is also of value to non-directive play therapy.

Theory of early emotional and social development – Erik Erikson

As Wilson and Ryan (2005) note, no sufficiently comprehensive and detailed theory of typical and emotional child development has yet been formulated in developmental psychology. In this section I draw on Wilson and Ryan's attempt to establish the relevance of Piaget and Bowlby's theories to non-directive play therapy.

A framework of child mental development was outlined (Wilson & Ryan, 2005), demonstrating how different components (motor, perceptual, affective and cognitive) form a cognitive framework of mental representations for understanding the world and how the insufficiently mobile schemas may cause a child troubling emotions and thoughts. Erikson's theory further serves as a means of broadening this framework to increase our understanding of child's emotional and identity development and the importance of play and play therapy in this process. Although, like Bowlby, Erikson comes from the psychoanalytic tradition, it will be argued that Erikson's ideas serve as a basis for understanding child development and are thus also relevant to non-directive play therapy.

Like Piaget, the influential and pioneering psychologist and psychoanalyst Eric Erikson believed that children should not be rushed into their development. Erikson proposed a universal theory of the development of the self, integrating information from anthropology on the role played by society and culture in a child's development. He outlined eight stages of development through the life cycle: infancy (birth to 18 months), early childhood (18 months to 3 years), play age (3 to 5 years), school age (6 to 12 years), adolescence (12 to 18 years), young adulthood (18 to 35 years), middle adulthood (35 to 55 or 65 years) and late adulthood (55 or 65 to death). Since this research was concerned with primary school children, only the first four stages and their relation to non-directive play therapy are reviewed in detail below.

Trust versus Mistrust (infancy: birth to 18 months). In the first stage of infancy, also called the oral sensory stage, the major emphasis is placed on visual and touch contact with the child. The mother's loving care and positive attitude play an important role in developing in the child a sense of trust in life and the world around him or her. If the mother fails to meet the child's needs properly, he or she can develop a feeling of worthlessness and mistrust in the world and in the future. The child's basic strength during this period lies in drive and hope. The most important relationship is with the maternal or constant care-giver. In terms of non-directive play therapy, children's trust in their therapist is the essential component of their healthy development. Therapists must create an environment in which children can trust them and in which they can thus trust themselves (Erikson, 1968).

Although trust is essential for a child's healthy development, one should not assume that a completely unquestioning attitude towards people and the environment is healthy. As Wilson and Ryan (2005) demonstrated, the fact that children with attachment disorders often show an absence of mistrust in unfamiliar adults is very worrying and greatly increases their vulnerability to mistreatment. The purpose of play therapy, then, is to assist the child to find a balance between trust and mistrust and to gain an understanding of their feelings and behaviour in social interactions with others.

During the *Autonomy versus Shame* (early childhood: 18 months to 3 years) period, children learn to master new skills such as walking, talking, feeding themselves and regulating toileting. As they gain more independence and control over their body during this stage, the will is developed, and this is often the time when children learn and practise how to say 'No'. However, if children are shamed in the process of learning these important skills, they may develop feelings of shame and doubt that can develop into low self-esteem in the future. Further, children who have developed a stronger than usual sense of the 'will to be oneself' (Wilson & Ryan, 2005, p.71) can be referred for therapy. This may occur owing to restraining or inconsistent care, when adults fail to protect children from making choices and experiencing situations, which are

beyond their ability to deal with. In addition, carers may fail to notice and adapt to children's developmental needs as the children's abilities and skills increase.

Non-directive play therapy gives a child an opportunity to re-experience feelings of over-restraint, defiance or doubt in a more permissive environment (Carmichael, 2006). Free play is important because it does not impose any demands or expectations on children, who are protected from having to make choices beyond their capabilities by the setting of necessary limits. The latter is particularly relevant to children whose care-giving is devoid of healthy criticism, which has not included instilling in the child a sense of responsibility for his or her actions. The non-directive play therapy principle of limit setting becomes the means by which children learn the possible impacts of their behaviour on themselves, others and their surroundings. It is a healthy way of learning safety boundaries without being shamed or ridiculed.

In the stage of *Initiative versus Guilt* (play age: 3 to 5 years) children start using play as a means to create play situations and role-play the adults and the life that they are seeing around them. For example, using toys, cars and experimenting with various scenarios in play helps the child to identify social roles. If given enough freedom and the opportunity to show initiative, children develop certainty in their ability to make decisions and lead others. It is the time when a child asks questions and enquires about the nature of the world and the things in it. Therefore, play is a perfect tool for the child to explore his or her own abilities and understanding of life. The role of care-givers is still highly important, since if the child's questions about the self and life are treated as trivial and their behaviour as a nuisance or embarrassing, the child is likely to develop a sense of guilt that may develop into slow interaction with others and a barrier to creativity.

In addition, Erikson (1963) emphasised the importance of children experiencing symmetrical relationships with care-givers or other significant adults. This equality should be based on the essential equality of worth between children and adults, despite the obvious inequalities owing to children's immaturity. This symmetrical relationship is used by children to explore adult-

child roles in their own families as well as social interactions in a wider society. The concept of symmetrical relationships is of primary value for non-directive play therapy. Like Erikson, both Axline and Rogers highlighted the fact that an equal therapist/child relationship is at the core of effective therapy, because this relationship allows children to explore other adult-child roles and questions related to them. Play therapy is the environment in which children can work through the feelings of guilt and shame that they may have developed as the result of inconsistent or inappropriate parental care. Play becomes an opportunity for them to learn to separate the inner reality of imagined crimes from the outer reality, as well as to reflect on the standards that they have internalised from their primary attachment relationships (Wilson & Ryan, 2005).

The next period of *Industry versus Inferiority* (6 to 12 years) is marked by the child's ability to acquire more complex skills, such as reading, writing and maths. Children become able to do more things on their own and the role of teachers and peers becomes primarily that of providing a source of self-esteem. The world expands more, and although family is important, the most significant relationship is with the school and the neighbourhood. The cause of this is children's development of a wider social identity which comes from 'a deeper understanding of peer relationships, of ways emotions are expressed in social contexts, and of ways to develop more lasting friendships, as well as from a greater ability to adhere to group rules' (Wilson & Ryan, 2005, p.79). As Erikson (1968, p.126) puts it, this period is a decisive stage socially because 'industry involves doing things beside and with each other', enabling children to experience the division of labour by having a role in a group, whether in organised groups or informal school tasks. The school environment provides a context in which children can compare their abilities and competencies with others. They can produce things which are possibly recognised only in that particular context, and which would probably remain unnoticed in the adult society.

Although the stimuli for a child's ability to compete and follow the rules in a group are important for healthy emotional and social development, over-stimulation, unrealistic expectations and failure to praise may trigger the child's

over-dependence on recognition by others at the expense of his or her inner sense of enjoyment. The absence of inner satisfaction in work may further lead to the child prioritising social over individual needs, resulting in a decrease of personally satisfying skills and the activities losing their individual basis for satisfaction (Erikson, 1968). In this stage the child's experiences of unresolved feelings of inadequacy and inferiority may lead to serious problems related to competence and self-esteem.

Non-directive play therapy may help children not only work through emotional difficulties related to skills development, but can also provide a context of free, non-goal oriented play as a form of relief from organised and demanding tasks (Wilson & Ryan, 2005). Non-goal oriented play is a way for children to connect to their own feelings and to find that inner sense of joy and satisfaction that has been lost but which, as argued by Erikson (1968), is necessary for their healthy emotional development. Often children's feelings of inferiority in therapy have little to do with their actual abilities to perform a task. Children are often afraid of 'getting it wrong' and this thought can hold them back from even trying. It is not until these feelings are processed that children can become more comfortable about taking risks and actually engage in seemingly simple activities such as cutting up paper or making collages.

On the other hand, if children have undeveloped abilities or even overestimate some of their actual skills, play therapy can help them start recognising their own pattern of abilities and achievements. The reflections made by a skilled therapist during the therapeutic process can help the child realise that 'everyone is inferior in some skills in relation to some other children, at the same time as being more confident or more skilled in other ways' (Wilson & Ryan, 2005, p. 84).

In addition, therapists' sense of competence and job satisfaction is highlighted (ibid.) as another necessary factor in enabling children to work through their emotional difficulties. Indeed, if the therapists do not feel competent, they may not be able to understand the child's feelings, and either minimise or over-emphasise the importance of these feelings. This presents a

challenge particularly for novice therapists who tend to praise children instead of simply reflecting their feelings and actions. Unfortunately, the outcome of such praise is to limit the child to engaging in specific types of behaviour that are considered 'good'. Therapists should not be afraid of or avoid giving children the freedom to make mistakes and explore reactions; on the contrary, these should be encouraged in a play therapy room.

Criticism of Erikson's theory

Many questions were raised in relation to Erikson's theory. The main criticism lay in the choice of method selected by Erikson, which was the biographical case study (Cole & Cole, 1989). This method was seen as time-consuming, expensive and difficult to apply. Erikson's belief regarding identity formation was criticised for not explaining the possibilities of personality change as a result of an individual's developing understanding and having various life experiences in adulthood. In addition, his theory does not answer the question of whether a change is possible throughout life. Critics of Erikson's theory say that he paid more attention to infancy and childhood than to adult life, despite his claim that his theory covers the whole of an individual's life span (Cramer et al.,1997). This criticism, however, did not present any issues for the current research, since it is early childhood that was the focus of this study and Erikson's theory offers a useful framework for analysing the developmental histories of children.

2.3.3 Therapist's role and objectives of therapy

In the previous subsection the child development theories of Piaget, Bowlby and Erikson were discussed, as well as their relevance for non-directive play therapy. The discussion is continued in this subsection, with a more detailed concentration on the therapist's role and the objectives of non-directive play therapy.

The therapist's main task is to facilitate growth. This is accomplished through establishing a trusting relationship with the child by being warm, empathic and understanding (Axline, 1947). Sensitivity, 'genuiness', transparency and congruence are the crucial factors in non-directive play

therapy (Ryan, 2007; Ryan & Wilson, 2000; Wilson & Ryan, 2005). The therapist's role is crucial, as it is the relationship between the therapist and the child that promotes and facilitates the child's growth. The therapist's intention in the therapy is to see, hear, feel and experience the child's feelings and experiences manifested in his/her play. The relationship established between the child and the therapist should carry the following messages (Landreth, 1991): I am here - nothing will distract me; I hear you; I understand you; I care about you. In addition, Landreth (2002) identifies the following skills that therapists should possess: tracking; reflection of content; reflection of feeling; enlarging the meaning; returning responsibility; facilitating creativity; encouragement; limit setting.

An interesting question is whether the therapist can participate in the child's play within the non-directive approach. Landreth (2002) points out that this decision is to be made by the therapist and based on the therapist's objectives. He does, however, emphasise the fact that the child's capacity for self-direction should be encouraged, and thus the intrusion of the therapist's personality into the child's play should be avoided:

'This is not a social time, and the child does not need a playmate. The therapist is there to help the child hear herself, see herself, understand herself, and be herself in the safety of an accepting relationship... The attitude of the therapist is the crucial variable, not the actual play participation.'

Landreth, 2002, p. 296

If the therapist decides to take part in the child's play (Landreth, 2002, p. 297) he/she has to: keep the child in the lead; keep the child in view; maintain an adult-therapeutic role (the therapist is not the child's playmate); maintain appropriate boundaries through limit setting. The latter includes not allowing toys or materials to be taken from the playroom because tangible objects should not be a substitute for an emotional relationship. Other reasons for keeping toys in the play therapy room are budgetary and out of consideration for other children who may want to use them. Further, children are not allowed to leave the playroom during the session, as they need to learn to take responsibility for a

relationship and to work things out rather than run away. The therapist has to keep to the session time limits so that the child knows what to expect and can experience stability. Further limits may need to be set in cases where, for instance, a child is too noisy and wants to play with the therapist's personal items. It is also necessary to limit the amount of water children can put in the sandbox and not allow urinating in the playroom (Landreth, 2002).

Although Landreth outlines valid rules, one should remember that they are only guidelines and should not be used blindly. Since it is NDPT based on the child's inner direction, there probably will be situations when a therapist may need to give the child's emotional needs priority over the static theoretical rules. For example, sometimes, if a child becomes overwhelmed in the play room, he can ask to leave the room to go to the toilet 3-4 times during the same therapy session. In this case, it is not wise to follow Landreth's suggestion of not allowing the child leave. First of all, NDPT principles require the therapist to believe in the child's inner wisdom that guides the child to grow and heal. Secondly, it is not always possible to know if the child has some health issues and may need to go to the toilet that frequently. Therefore, the therapist must be always alert to the child's needs and requests within a particular context.

The child's need to be noisy is another example that illustrates the necessity of following NDPT principles while at the same time keeping the child safe, mentally and physically. Some children, especially those who have suffered sexual abuse, often use loud hissing and screaming in their role-plays. To ban this type of expression may interrupt the therapeutic process and be counter-productive. It might be a better idea to negotiate with the child about the way in which he can express his emotions so that it is contained and does not disrupt the work of others (e.g., if the therapy is taking place on school premises), instead of forbidding the child to engage in this type of expression altogether. Therefore, if it is truly NDPT, the therapist will follow the child's lead and will find a way of having the child's needs met but at the same time keeping him safe, without forcing him into 'acceptable and comfortable' behaviours. It is more about maintaining the fine balance of following the NDPT principles and establishing only those limits which are crucial for the child's safety.

Landreth (2000, pp. 87-89) identifies 10 objectives of non-directive play therapy for children: develop a more positive concept of self; assume greater self-responsibility; become more self-directing, self-accepting and self-reliant; engage in self-determined decision making; experience a feeling of control; become sensitive to the process of coping; develop an internal source of evaluation, and become more trusting of themselves. Although these objectives are identified for the therapy, the sessions are not goal-oriented. Since it is the child who is in the lead, the therapist does not introduce the agenda, nor does he or she judge or rush the child through the therapeutic process. According to the non-directive or sometimes called child-centred play therapy model, therapists do not conduct 'extensive histories or formal assessments' either (Carmichael, 2006, p.119). In order to achieve the therapy goals outlined above, the therapist has to follow Axline's principles of non-directive play therapy and trust the process (Munns, 2011).

2.3.4 Play therapy room

The environment of non-directive play therapy should be supportive and non-judgemental, warm, secure and fun (Sallman, 2007). It can be a separate room or just a part of a larger space but should always be welcoming for children. Landreth (1991) describes the 'ideal playroom', which would be 12 by 15 feet or 150 to 200 square feet. It would be suitable for two or three children as well as allowing the therapist to be close to the children without chasing them around the room. In order to provide the child with a sense of security, safety and freedom for self-expression the room should allow for privacy, with no outside windows or windows draped or covered with blinds. The floor should have no or minimal carpeting in order to allow the child to engage in a messy play without having to worry about damaging the floor. It is recommended that wall coverings contribute to a bright and cheerful atmosphere and that they are washable so that children can engage in messy play without fear of punishment. The playroom should be a quiet place and far enough from the waiting room to respect the child's privacy. It is also recommended that the ceiling be covered with sound-proofing tiles to minimize noise.

Further, ample shelf space is needed on at least two walls. The top shelf should be no higher than thirty-eight inches and sturdy enough to climb on. A small sink with cold running water and a countertop with storage accompanying the sink area are also recommended. A chalkboard or a marker board is required to promote non-verbal expression. It would be ideal if there were a small bathroom in the playroom so that a child does not have to leave the room in order to go to the toilet. It is desirable to have a one-way mirror and sound equipment for videotaping and supervision purposes.

These room requirements are not always easy to achieve. For example, in the UK many play therapists work in schools and it is difficult, if not impossible, to obtain a room like the one described above. Often play therapists do not have a specific room allocated to them and have to change locations every other week, making it necessary for them to carry the toys and other play materials around. There is thus a need to have all necessary materials stored in a box and ready to be moved from one location to another. Many of the other play therapists I have worked with have often expressed the desire to have an easily transferable magic box with all the necessary tools and play materials in it.

2.3.5 Categories of toys

Toys and play materials are seen as an extension of the child's self (Schaefer, 1993) and should be carefully selected to provide children with opportunities for self- expression. It is recommended that toys have more than one use (Sallman, 2007), but also that 'toys and materials should be selected, not collected' (Landreth, 1991, p. 117).

To provide a child with a sense of order and consistency, it is recommended that in every session the toys are put in the same place (Kottman, 2001). 'Since toys are child's words, the child should not have to go searching for the toys needed for self expression' (Landreth, 1991, p. 128). The type of play materials determines the type or degree of the child's expression. Some toys have a definite purpose (e.g., a cushion or a bag for hitting), while others could be used creatively for symbolic expression (e.g., blocks for use as

aeroplanes) (Schaefer, 1993). Landreth (1991) defines three main categories of toy types and Kottman (2001) extends these to five.

The first category is Real-life Toys, also called Family Nurturing Toys, which are used to express hopes, fears, feelings, crisis situations and family conflicts. A doll family, a doll's house and puppets are used to help the child to distance him or herself from an actual event. Cars, trucks, boats, planes and a cash register are used to engage the child in uncommitted play without the expression of feelings. Play with money and a cash register can give a child a sense of control and order, while animal families, baby clothes, baby's bottles, a cradle, a warm soft blanket, stuffed animals and toys, sand in a sandbox, play kitchen pots, pans and dishes are used to promote the child-therapist relationship.

The second category of toys is Acting out or Aggressive-release Toys. A punch bag, weapons, play guns, swords, knives, toy soldiers, military vehicles, aggressive puppets, small pillows for fighting with, foam bats, plastic shields and handcuffs are used for the symbolic release of anger and aggression, for facing fears and for exploring control issues.
To create opportunities for the child to deal with fears, Scary Toys like snakes, rats, plastic monsters, dinosaurs, sharks, insects, dragons, alligators, 'fierce' animal puppets and toys that represent a specific trauma are used.

The next category is Creative Expression and Emotional Release Toys. Easel and paints, watercolours, crayons, markers, glue, Play Doh or clay, finger paints, scissors, tape, egg cartons, feathers, tools for making masks and pipe cleaners are used to help children express feelings, to give them a sense of mastery, to enable them to practise problem-solving skills and to express creativity. For these purposes, sand and water trays are also introduced into the playroom. These materials lack structure and can become anything a child wants to make of them. Blocks are used to encourage constructive and destructive play.

Finally, Pretend and Fantasy Toys are used to provide opportunities for children to express feelings, explore a variety of roles, experiment with different types of behaviour and attitudes, act out different situations and relationships, and act ‘as if’. Examples of toys in this category include: masks, costumes, magic wands, hats, jewellery, purses, people figures, zoo and farm animals, puppets and a puppet theatre, a sandbox, trucks and construction equipment, kitchen appliances, pots, pans, dishes, silverware and empty food containers (Kottman, 2001). Figure 1 below shows an example of a play therapy room that includes the five categories of toys described above.

Figure 1. Play therapy room

Non-directive play therapy does not usually restrict the types of play, but not all toys are appropriate for child-centred therapy (Roffer, 2006). Sweeney and Landreth (2003) point out that any toys that are mechanical, complex, highly structured or dependant on therapist’s instructions would be unlikely to facilitate a child’s expression of feelings and emotions. Moreover, they can cause feelings of frustration and dependency in children who already feel inadequate. Roffer (2006) concludes that computerised play therapy, therefore, may not be useful in child-centred play therapy.

The above conclusion is well argued and valid but, nevertheless, questionable in light of newly emerging multi-touch technologies such as interactive tabletops (discussed in more detail later in section 3.2.2). What if a computerised toy is easy for the child to use and requires no instructions from the therapist? What if it does, in fact, facilitate the expression of a child's feelings and emotions? Very little research has attempted to address these questions or to produce empirical evidence as to whether or not the computerised toys of the new generation could be used in child-centred play therapy.

At the same time, the paucity of such studies is not surprising. Since the child/therapist relationship is considered to be the core of child-centred therapy, toys become of secondary importance in developing the therapeutic relationship. Therefore, most attention is paid to the way the therapy is conducted and very little to the play materials being used by the child. Although this may seem perfectly reasonable, it is important to remember that, since they are the child's language and the means of communicating the child's feelings and emotions, toys still play a big part in the therapeutic process. If the therapy is truly non-directive, should children not be able express themselves through a computerised toy, if this toy is easy to use, facilitates a wide range of expressions and does not interfere with the child/therapist relationship? This is one of the questions that the current research attempted to answer.

2.3.6 Effectiveness of non-directive play therapy

Non-directive play therapy has a long history of effective use in elementary schools, and according to Landreth (1993) it is more than any other play therapy approach, truly developmental in nature, as it does not put any pressure on the child to change. In the UK, Wilson and Ryan (2005) undertook a small process and outcome study with the trainees on the play therapy training programme at the University of York. Their study found that NDPT was effective on a range of measures, including having a positive impact on parental behaviour. Research into the effectiveness of NDPT in addressing specific problems (e.g., difficulty in reading and identity problems) has also been carried out in the States (Boehm-Morellis, 1999, Kaplewicz, 1999). It has suggested that

although play therapy has no effect on specific issues such as reading achievement, it does indeed improve a child's self-concept. Further studies suggest that NDPT has a positive impact on reducing a child's physical and verbal aggression (Sloan, 1999), and on improving self-esteem, academic performance, social relationships and impulse control (Mann & McDermott, 1983). As Wilson and Ryan (2005) note, these studies are encouraging for the practice of NDPT; however, small case studies are not sufficient to establish when, how and in what circumstances NDPT can be used as a successful intervention. Therefore, more research, which uses larger samples, control groups, and specified procedures, is needed in order to assess the effectiveness of NDPT.

2.4 Part 2. Digital technology in the mental health arena

In Part 1 of this chapter the origin, theories, principles and processes of non-directive play therapy were discussed. Part 2 explores the use of digital technology in a therapeutic context, highlighting computers and robotic tools as the digital tools most widely employed in therapies with both adults and children (Figure 2). This section concludes that while it is generally agreed that there are advantages and disadvantages to using digital technology in a therapeutic context, there is a dearth of studies that have investigated the use of digital technology as toys specifically in non-directive play therapy with young children.

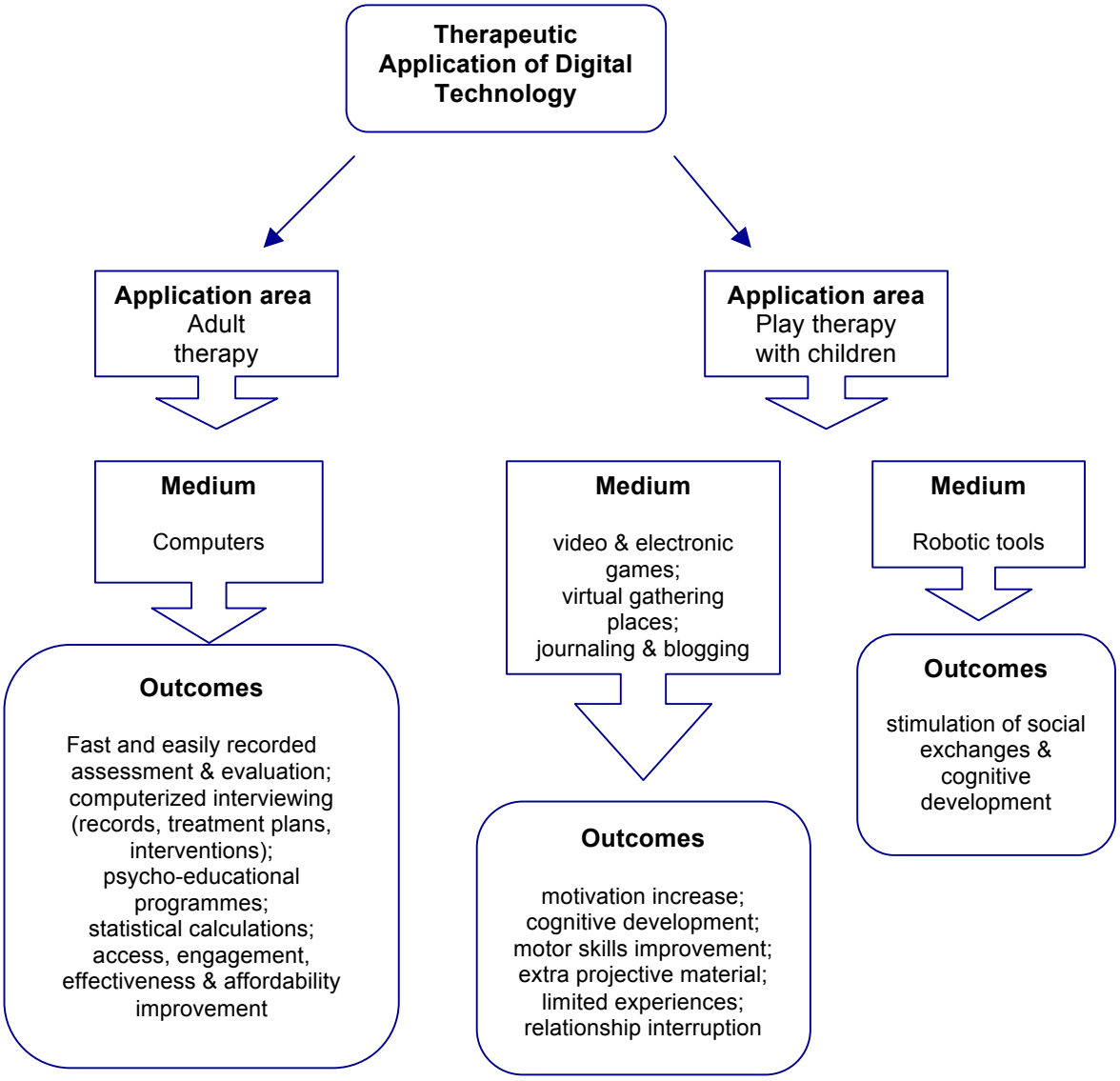

Figure 2. Digital technology in mental health

2.4.1 Computers and mental health: past and present

Although the use of computer technologies in play therapy is a newly developing area, the first attempts to develop computer-assisted therapy date back to 1966, when a German-American professor in computer sciences, Joseph Weizenbaum, created a program called ELIZA, named after George Bernard Shaw's Pygmalion. ELIZA was a program for natural language processing, which literally processed humans' responses to scripts. The uniqueness of the application based on the running script DOCTOR lay in its capability to engage an individual in a conversation with 'a virtual psychologist'. The computer-assisted therapy was modelled according to Carl Rogers' client-

centred therapy principles, encouraging people to participate actively in sessions through answering open-ended questions.

ELIZA was implemented using simple matching responses, and it took only a few minutes and a few interchanges for the user to understand the machine's true lack of understanding. The intention in developing the system was to sidestep the problem of giving the program a database of real-world knowledge and it was never intended for use in the therapeutic context (Weizenbaum, 1966). Positive responses regarding the use of ELIZA in non-directive therapy, however, made Weizenbaum (1976) write a book called Computer Power and Human Reason: From Judgment to Calculation. It presents his views on the limitations of computers, making clear that the latter are just a reduction of the human being and the life form itself and should not be used in therapy.

Despite the fact that he did not take the concept seriously and even became a leading critic of similar programs later, Weizenbaum is considered as the founder of Artificial Intelligence (AI). The concept of AI was taken further by Wagman (1980), and he developed a program that attempted to use a natural language system called the PLATO Dilemma Counselling System. Two years later, Selmi and his colleagues (Selmi et al., 1982) produced MORTON, the computerised cognitive-behavioural therapy program, the principles of which served as a prototype for later developments in computer-assisted therapies.

The computers served not only as a tool for the therapy session itself, but also as the means of assessing and evaluating the client's progress. The Mayo Clinic developed a computerised test scoring system as well as the first computerised psychological assessment program for initial evaluations and interviews (Stillman et al., 1968). The use of computers in therapy continued during the late 1970s, resulting in the development of a psycho-educational program for drug users (Cassell, 1971), a suicide prediction program (Greis et al., 1973) and anxiety treatment programs (Biglan et al., 1979). During this time, other applications for the computer included the management of patients,

research, the administration, scoring and interpretation of psychological tests (Roffer, 2006).

As a result of positive feedback by patients, computer programs were also introduced and used to a great extent in health care for conducting computerised interviews (Somu & Bhaskar, 2011) as well as for keeping patients' records and developing treatment plans and interventions. The use of computer programs in assisting the treatment and management of patients continued in the 1990s with the introduction of electronic versions of the paper and pencil tests by a company called Psychological Assessment Resources, Inc. (PAR). Moreover, the contribution made by computerised statistical calculations in psychology can hardly be overestimated. Instead of performing calculations by hand, they can be done quickly and presented conveniently in tables and graphs.

In addition, recent research on the use of technology to support mental health has shown the potential of technology to 'significantly improve access, engagement, effectiveness and affordability of treatment for mental health problems' (Doherty, Coyle & Matthews, 2010, p. 243). Various systems have been designed for mental illness prevention, computer-based treatments and face-to-face therapy. The ways in which therapies can be conducted have also been influenced by the Internet. Thus, online text therapies via email as well as video and telephone therapies, although not favoured by all therapists, are just some examples of how technological developments have influenced psychology. Furthermore, online databases make it easy for practitioners and researchers to share information and experiences.

2.4.2 Digital technology used with children in the therapeutic context

It appears that little research has been conducted into the application of digital technologies in the play therapy field specifically. However, a number of studies on the therapeutic effects of play through digital technologies with children and young people have been undertaken (Brooks & Peterson, 2005).

Motivation & Engagement. One of the main focuses in the literature is on the impact of computer games in therapy. It is claimed that several *video games* (Sony, Eye Toy, Little Big Planet, Pixel Junk Eden) have had therapeutic effects on children, as well as helping them to develop thinking skills and improve focus, self-control and self-awareness (Brooks & Peterson, 2005). For example, Sony Eye Toy includes a user interaction game and allows a child to associate with a virtual character through an interface with the virtual environment without having to use any wearable technology. A small-scale exploratory study investigating the potential use of this game in therapy with special needs children (5-12 years old) suggested that although the children quickly became bored with the game, it had increased children's motivation to engage in therapy due to being interesting and fun for children (Brooks & Peterson, 2005). It would be interesting to find out whether the playful aspect of games could aid in the promotion of trust, which is so necessary for building a therapeutic relationship in NDPT (Axline, 1947). Indeed, the research on motivation by means of technology is helpful for understanding how digital tools can motivate children to trust and open up, to enable them to re-work their emotional and cognitive schemas in a play therapy room.

Cognitive development. Computerised games could be an appropriate tool in therapy for the evaluation of a child's cognitive development. Many computer programs, based on Vygotsky's theories described further in section 3.2.4, have been designed to include functions for adjusting the level of difficulty of the tasks to the child's responses (creating a zone of proximal development - ZPD) and a level of cognitive development. For example, engaging a child in such a game may allow the therapist to find out what problem-solving skills the child has, and to determine the best way to proceed with the therapy. Computer games can also be used for developing problem-solving skills, which are especially important in Cognitive-Behavioural play therapy. Developed problem-solving skills can result in fostering independence, self-esteem, autonomy, strengthening the ego and cognitive maturing (Roffer, 2006). Although potentially beneficial, these games based on ***scaffolding*** and the concept of the ***More Knowledgeable Other (MKO)*** are hardly applicable in an NDPT context owing to their highly structured and directive nature.

Limited experiences. One criticism of traditional computer games, however, is that the type of play they offer is overly structured, and that they contain non-symbolic modalities through which 'little apparent unconscious material [is] communicated' (Bellinson, 2005, p. 200). In other words, traditional computer games do not allow for the creativity and symbolic play necessary for the processes of assimilation and accommodation in NDPT (Piaget, 1952; Axline, 1947). If a game were to be introduced in an NDPT context, it would need to create opportunities for free self-expression rather than dictate what has to be done.

Further, although computers offer excellent opportunities for child to learn adaptive behaviour, they do not provide the full range of sensory experiences necessary for motor skills development. A child's need for movement can also be limited to mere hand-eye movements (Roffer, 2006). The aim of NDPT is to establish a permissive environment in which children can express anything they like (Axline, 1947). Thus, a single mode of expression, whether this is traditional toys or digital tools, will not be enough, and it will be necessary to use both types of toy in combination.

Motor skills improvement and better therapy tracking. It has been shown that the use of computer technologies increases reaction time, motor skills and hand-eye coordination (Dobnik, 2004). It allows for better therapy session organisation, data collection and more structured and controllable therapy settings as well as being a tool for therapy and assessment that increases motivation and reinforcement (Calam et al., 2000). Various types of feedback (sounds, vibrations, a voice saying 'well done' or even cold air blowing into your face) can be implemented with the computer program (Roffer, 2006), which can solve the problem of the technology limiting the child's sensory experiences. The use of computers could benefit therapy by creating increased symbolic possibilities by providing a 'cordless' umbilical connection and by expanding play therapy possibilities in general (Olsen-Rando, 1994; Gardner, 1993; Zelnick, 2005). Multiplayer games may help children to develop the skills they need to manage stress and emotions. Although computerised monitoring of child's play

may have little to offer NDPT, as NDPT does not favour assessments or tightly controlled therapy settings, the use of computers would undoubtedly increase the number of creative tools available for the therapy. In other words, the options of bringing natural and otherwise inaccessible forces into the play room (e.g., blowing air) may be beneficial for the child's creativity and support the NDPT principle of establishing an environment in which a child can express absolutely anything (within necessary safety limits).

Relationship building. Although they have been found to have positive effects on children's motivation, cognition, problem-solving skills and motor skills, it has also been shown that computer games can increase short and long-term aggressive behaviour (Anderson & Dill, 2000) and can restrict communication between a child and therapist by excluding the latter and absorbing the former in play with the machine. In this case, as in NDPT literature (Carmichael, 2006; VanFleet et al., 2010) the engaging nature of technology could be seen as a potential danger. In addition to this engaging characteristic of technology, the use of single-user video games interferes with therapist/child sharing and connecting on an emotional level. Indeed, in order to build a trusting relationship it is not enough to motivate a child with a digital toy. The computerised device would have to allow for the ***sharing*** of expressive activities and for ***connecting*** during the process of playing.

Self-expression. Ceranoglu (2010) argues that despite the possible dangers the technology may have for therapy sessions, it can also be beneficial in revealing psychodynamics and can be seen as projective material, which is the means of expression for a child and the mode of communication between the latter and the therapist. This was found earlier by Bellinson (2005) in a case study of a child whose socialisation and communication difficulties were relieved through therapy sessions that revolved around his play with the electronic game Gameboy. Enabling a child to express unconscious and conscious feelings and thoughts with the aim of either learning to control or abandon them is one of the functions of NDPT (Wilson & Ryan, 2005). It, therefore, seems that the ability of

technology to assist the client's self-expression could be potentially beneficial for NDPT.

Fantasy and imaginative play. Another focus of recent research has been on the therapeutic effects of *virtual and digitally mediated gathering places* such as *virtual reality and landscapes* (e.g., Second Life, Meez and Pixie Hollow). The use of *avatars*, 'the visible representation of a human appearing in a computer generated world' (Anthony & Lawson, 2002, p. 2) and *a virtual environment*, 'a simulation of a physical space using 3D graphics...' (ibid., p. 7) are suggested for play in therapy. Even though the effectiveness of these innovative technologies in therapy with children has not yet been thoroughly researched, the positive use of a therapeutic virtual environment for adolescents suffering from hemodialysis has been demonstrated and it is claimed to be a way of distancing oneself from a severe medical condition (Bers et al., 2001). It may be possible to enhance the fantasy and imaginative play that is one of the play types that children engage in during NDPT by the introduction of digital avatars and virtual reality in an NDPT context.

Phobia treatment. The use of virtual reality technology has proven to be an effective treatment of patients with a phobia of flying in exposure therapy (da Costa et al., 2008; Brinkman et al., 2010). Through creating a virtual simulation of the environment a patient is fearful of, he/she gets a chance to face the fear gradually, supported by the therapist. Virtual reality can be seen as more effective than traditional play in this respect, since it makes it possible to recreate the environment of a particular situation more accurately and realistically. In addition, it can provide a more lifelike experience and promote cognitive growth (Roffer, 2006), and has been demonstrated to be effective in treating anxiety disorders with positive follow-up results (Rothbaum et al., 1995; Rothbaum et al., 2002). Most research into the use of virtual reality in therapy, however, has involved the simulation of physical aspects of the environment (simulations of heights, spaces, experience of flying etc.), and the treatment of phobias. Simulations of social aspects (empowerment, empathy, expression of emotions etc.) have still to be explored. It is a question of whether Vygotsky's

concepts of scaffolding and a MKO could be helpful when using digital tools for phobia treatment in NDPT.

Another application of digital technology in therapy is through the *journaling through blogging, webpage creation, re-inventing oneself* and *online charts* available on social networking sites, and this is believed by some play therapists (Rubin, 2007; Riviere, 2008) to have similar benefits to those gained in play therapy: appreciating others' perspectives, expressing deeply private thoughts and feelings, working through painful and traumatic events and experimenting with new identities, to name but a few. Moreover, it has been proposed that the use of social networking is in line with the goals and therapeutic elements of Donald Winnicott's (1953) objects-related play therapy, which emphasised the role of a transitional space between the inner and outer worlds and between people, in which relationships, creativity and growth occur (Rubin, 2007).

In addition, blogging and online chatting can become a tool for bringing out the more hidden aspects of one's self. Thus, Zelnick (2005) provides an example of how he could witness his client's experiences of rejection, disappointment and helplessness using online instant messaging. However, it seems that social networking might be more suitable for older children who have already developed the skills and abilities required for using computers. It is feasible to adapt virtual environments for play therapy sessions by creating virtual child play rooms filled with toys and interactive multimedia games to facilitate discussions and the re-living of experiences during play therapy sessions (Rubin, 2007). However, it is not possible for young children to express themselves through chat rooms, Twitter or journaling as they have not yet developed the necessary cognitive and verbal skills.

Symbolic expression. While social networking offers opportunities for improving creativity and emotional well-being through play, *robotic tools* are introduced with therapeutic and rehabilitative purposes. Early examples include the design and further use of robotic stuffed animals to help children with cardiac issues to talk about their problems and cope with the situation (Bers et al.,

1998). Tracey and Montemayor (2001) developed a prototype storytelling robot for use in the rehabilitation of children with developmental disabilities. This technology has also been used to encourage children with neurological traumas to practise their motor skills in physical therapies (Fukamoto, 2010). Although the development of physical skills is not the aim of NDPT, enabling children to express themselves, for example through storytelling, is. Since young children are not likely to create stories verbally, storytelling in this case can be done by means of symbolic expression and fantasy play (toys and images).

Robots were developed for the stimulation of social exchanges and cognitive development of children with socio-relational disturbances, retardation and autism, as well as for emotionally and mentally handicapped children, to provide opportunities for the latter to engage in and enjoy play to the full, and this was also claimed to have therapeutic effects (Dautenhahn & Werry, 2004). Back in 1976, Sylvia Weir and Ricky Emanuel used a remote control robot as a remedial device for an autistic seven-year-old boy. The results demonstrated the positive effects of the boy's explorations of controlling the robot on his behaviour. A set of recent experiments on the therapeutic effects of playing with robots was conducted within the AURORA (AUtonomous RObotic platform as a Remedial tool for children with Autism) project. Through play with the designed toy, called Robota, children's imitation dynamics and social interaction skills were encouraged.

Another project called IROMEC (Interactive RObotic social MEdiators as Companions) targets children who are prevented from playing by cognitive, developmental or physical impairments. Robotic toys that provide opportunities for leaning and enjoyment, the use of which could also possibly have positive effects on children's mental health and well-being, are the focus of the investigation. The aim of NDPT is not to teach children, but joyful experiences in a play therapy room are considered beneficial. Indeed, computerised toys have much to offer to encourage the enjoyment and fun aspects of play.

2.4.3 Summary

As seen from the research reviewed in this section, computerised statistical calculations, easy access to services, better engagement and affordable treatments are the advantages of using computers in adult therapy. The benefits of a computer-assisted therapy process, and assessments and evaluations conducted by a virtual/artificial therapist remain, unsurprisingly, highly questionable. Humans are complex beings with unpredictable reactions and a wide range of feelings that cannot be reduced to simple formulas and algorithms for the computer to react to. It would be especially difficult within the non-directive approach, where the client has to be in the lead, so that the structure and content of sessions are uncertain and unpredictable, which may be too much for an artificial therapist to deal with. It may result in more damage than help and certainly cannot result in the creation of a therapeutic alliance based on trust, congruence and the unconditional acceptance necessary for non-directive counselling. Moreover, no artificial therapist can replace the experience of developing a relationship with another human being, witnessing another human's story and sharing experiences, which is at the core of humanistic psychology.

On the other hand, previous research has established the foundation of a few benefits of the use of technology in therapy: trust-promotion, scaffolding, self-expression, creativity, enhanced fantasy and symbolic play, enjoyment and fun. In light of these benefits of the previous use of traditional technology in the mental health arena, it is reasonable to ask if there is a place for novel digital devices for use specifically with young children in a NDPT context? In the next section, research on the use of traditional technology in counselling with children is reviewed. I also explore in detail new computers called interactive tabletops, their current use and potential benefits for educational and therapeutic contexts.

2.5 Interactive tabletops: Introduction

There are hardly any studies on the use of digital technology specifically within non-directive play therapy with children, which is not surprising, since the development of a relationship is the core of the non-directive approach.

Technology such as video games, virtual environments, journaling and robotic tools has the potential to increase motivation (Brooks & Peterson, 2005), aid in cognitive development (Roffer, 2006), motor skills improvement (Dobnik, 2004) and the stimulation of social exchanges (Dautenhahn & Werry, 2004). The limited number of experiences available (Roffer, 2006), the possible increase in aggressive behaviour (Anderson & Dill, 2000) and interference in the therapist/child relationship (Carmichael, 2006; VanFleet et al., 2010) have been listed among the main disadvantages of using digital technology with children. The research undertaken into the therapeutic benefits of robotic tools (Bers et al., 1998) focuses mainly on the design, rather than on an evaluation of the effectiveness of those tools, which makes it difficult to assess the therapeutic value of robots for children in the long term. It seems that not all the reviewed technology and games can be applied in NDPT as they are not all in line with NDPT principles, which emphasise the importance of relationships, freedom, expression and non-direction (Axline, 1947). This subsection introduces a novel technology - 'interactive tabletops' - and raises the question of the possible benefits of this technology for NDPT as a result of the new features and affordances it includes that make it significantly different from traditional computers. A short history of computers and their development is first presented. Following this, interactive tabletops, a new generation of computers with a horizontal display that allow face-to-face communication and creative expression, are introduced. The SMART tabletop and its affordances are explored in detail. Research into the use of interactive tabletops in educational and therapeutic contexts is discussed. Taking into account the affordances of SMART tabletops and the concerns of non-directive play therapists described earlier, this section concludes by raising questions about the potential suitability of this new technology for non-directive play therapy.

2.5.1 Interactive tabletops versus traditional computers

The computer, 'a programmable usually electronic device that can store, retrieve and process data' (Merriam-Webster dictionary, 2012), was developed between 1940 and 1945 in the United Kingdom and United States. Originally, a single computer took up an entire room, and consumed as much power as a few hundred modern personal computers. At that time mechanical analogue

computers were used for military applications. The appearance of personal computers in the 1980s allowed individuals to have access to computers on the desks in front of them, rather than on the central mainframe (Muller-Tomfelde et al., 2010). The vertical screen of a desktop computer is a metaphor for Graphical User Interface (GUI) that provides opportunities for simplified interaction with the physical desktop. Since the time computers were first invented, they have undergone a rapid process of development: for example, the development of laptops, modern mobile computers that possess the same components as desktop computers, but are now faster and easily portable.

The development of computers has recently progressed even further with the emergence of a new generation of computers called interactive tabletops. Unlike traditional computers that have a vertical screen designed originally for one user only, tabletops are horizontal displays that include group interfaces and provide opportunities for direct interaction with digital information (Figure 3) (Muller-Tomfelde et al., 2010). In other words, while possessing the main features of traditional computers, such as an ability to create, organise, store and retrieve information, interactive tabletops are aimed at multi users (usually up to four), interacting directly with a horizontal computer screen rather than using a keyboard and a mouse. This new technology is not to be confused with virtual environments, however, in which all sensory presentation is synthetic and most interaction is three-dimensional. Instead, interactive tabletops should be seen as occupying a space in the middle, between computers and virtual environments, as they provide both a physical environment and the possibilities of digital space (ibid.).

Figure 3. Traditional computer versus interactive tabletop

Interactive tabletops, as commercial products, have been developed over the past 15-20 years but have not yet reached the mass market. Their high cost and the public's unfamiliarity with the technology could be among the reasons for this. It has been small enterprises and research organisations that have started using interactive tabletops, drawing the attention of the public to them. Recently, larger companies with substantial research and public relations departments have begun to employ interactive tabletops in the entertainment, educational and domestic domains, and they have also been used as attractions at fairs and exhibitions (Muller-Tomfelde et al., 2010).

2.5.2 What is a SMART interactive tabletop?

A SMART interactive tabletop is a multi-user coffee table-sized multi-touch tabletop system that allows groups of early education students to work simultaneously on one surface (SMART Technologies, 2012). It was produced by SMART technologies, a Canadian company incorporated in 1987 that developed a well known SMART board in the mid-1990s. The latter is an interactive whiteboard, which, like a computer, is based on touch detection user input (e.g., scrolling and right-mouse clicking). Unlike a computer, however, it uses a projector to display a computer video on the whiteboard that serves as a large touch screen. Learners and teachers can interact with the board by means of a special pen with digital ink. It took about 7 years from the development of the interactive whiteboards for them to become popular and they have been largely used with children in schools. Since 2009, the SMART whiteboard has been able to register dual touches, rather than just a single touch, at a time.

Interactive tabletops, a product developed relatively recently by SMART technologies, have become a new step forward in the process of the company's innovations. The SMART tabletop comes together with a SMART table toolkit, learning activities that aim to develop cognitive, social and fine motor skills. The company claims that even relatively shy children feel comfortable participating and demonstrating leadership skills when completing group work, including children with special needs (SMART technologies, 2012).

Unlike other interactive tabletops (e.g., the Microsoft multi-touch surface) developed for entertainment and creativity purposes in the business area, the SMART tabletop (Figure 4) is aimed specifically for use with primary school children in the educational domain.

Figure 4. A SMART tabletop

The unique features of the SMART interactive tabletop include the following:

Face-to-face interaction

Unlike a traditional computer, a size of a horizontal screen of a SMART table (221/2"L×167/8"W (57.2cm×42.9cm)) enables learners to work together in small groups to complete problem-solving and any other tasks that involve consensus building.

Simultaneous multi-touch capability

The SMART table aims to encourage active learning (versus passive participation) by allowing small groups of students to interact simultaneously on the multi-touch surface.

High image quality

High quality images with no shadows or glare enable multiple students to interact on the surface simultaneously without their shadows blocking each other's view of the screen, which fosters collaboration and increases engagement.

Natural interaction

The SMART table supports simple, intuitive gestures like rotate, toss and zoom. Interaction with the surface is easy and natural for students and does not require instructions from the teacher.

Rugged design

The SMART table, developed specifically for use in the classroom, is designed to be sturdy and durable. It supports up to 200lb. (90kg) on its scratch and spill-proof surface and features a child-proof power button. To protect it from sudden shutdown owing to a loss of power and to prevent activity interruptions and a consequent loss of classroom time, the table is equipped with a built-in universal power supply.

Easy set-up for instant interaction

It is easy and fast to start up the SMART table. It comes virtually ready to use out of the box, so there is little set-up or installation required. This reduces the cost of expensive technology integrators and saves time for school IT staff.

Friendly universal design for learning (UDL)

The technology meets UDL standards and gives teachers the flexibility to provide multiple ways for students to interact with lesson content and express knowledge.

Mobile design

It is easy to move the SMART table from classroom to classroom, allowing one school to share an interactive learning centre between many rooms.

Brings objects to life

It is possible to record and capture images from the SMART table, making the sharing of any object easy.

Built-in Wi-Fi

It is possible to connect to the local network from anywhere in the school by means of the built-in Wi-Fi.

2.5.3 Current research on the use of interactive tabletops

Although they were originally developed for the areas of business and entertainment, interactive tabletops have been received much attention in the educational domain because they enrich face-to-face interaction, physically support objects and facilitate co-located collaboration and coordination (Dillenbourg & Evans, 2011). The main criticism of the tabletops as used in education is that initially researchers and users are highly enthusiastic about this novel technology, but when it comes to its widespread application, there is little evidence of any positive impact on learning outcomes (Higgins et al., 2011).

Nevertheless, despite the lack of empirical evidence in pedagogy and educational studies, the research conducted in the field of human interaction suggests that when used in the classroom tabletops promote peer collaboration and face-to-face interaction (Hatch et al., 2009). Further, the tabletops have been demonstrated to support problem solving in teamwork (Dillenbourg & Traum, 2005) and to encourage the externalisation of thinking and the development of higher order skills (Kharrufa et al., 2010). They have also been used to develop children's diachronic thinking and to explore how children collaborate on meaningful and challenging design tasks (Rick et al., 2011).

In addition to supporting children in their cognitive development in learning, tabletops seem to support collaboration between users in a therapeutic context. For example, games on an interactive tabletop have been used to support collaboration between therapists and children with Autism Spectrum Disorder, a neurological disorder that affects behaviour and the ability to communicate and interact socially, in Cognitive-Behavioural Therapy (Giusti et

al., 2011). Developed in this study system called Join-in Suite aimed to explore specific types of collaboration, such as joint performance, sharing and mutual planning, by means of three tasks designed based on various social stories and problematic situations. In each task the user had to follow the following structure: explore, listen and discuss, explore the alternatives and choose. The findings from the field study with two therapists and eight children demonstrated that the system, while allowing for motivation, excitement and the feedback necessary for gaming, also served as a therapeutic intervention that encouraged a sense of control and empowerment.

Another attempt to introduce interactive tabletops in a therapeutic context was made by Hancock et al. (2010). The purpose of the study was to design a virtual sand tray application for sand tray therapy with young teenagers. The findings suggest that while the engaging nature of computers could be problematic, it can also be advantageous in terms of allowing the therapist to step aside and observe the client's behaviour more objectively. Focusing on the therapists and their ability to interpret the actions being performed on the tabletop display, the results showed that the use of 'precise interaction and a physics engine can together provide a richness that is sufficient for therapists to understand things about the client's psyche through their interactions with the virtual artifacts' (Hancock et al., 2010, p. 2142).

Recently, the use of tabletops has been extended to promote children's creativity through play activities such as storytelling and fantasy play (Mansor et al., 2009). StoryMat (Cassell & Ryokai, 2001) is an early example of a device that supports children's collaborative storytelling through fantasy play. This device was designed in the shape of a soft, quilt-like mat with appliquéd objects like horses and roads, and served both as a platform for creating a story as well as being a participant by recording and retelling the created story. After retelling the created story, the StoryMat would compare it to past stories with similar patterns recorded by other children, thus allowing the child to produce more creative story endings. The findings collected through an experimental study suggested that StoryMat fosters and exercises the imagination, allowing children

to express themselves verbally in the form of more developmentally advanced narratives and less resembling pretend play (Cassell & Ryokai, 2001).

Following the development of StoryMat, and similar systems like Rosebud (Glos & Cassell, 1997), PETS (Druin et al., 1999) and Page Craft (Budd et al., 2007), recent attempts have been made to research storytelling and imaginative play on interactive tabletops through developing a TellTable, an application that allows children to develop their own stories by means of photos of real world objects and drawings (Cao et al., 2010). Interestingly, unlike previous systems based on the holding-a-button-while-telling-a-story principle, the design objectives of TellTable included keeping in touch with the physical, encouraging and sharing self-expression, as well as ensuring playfulness, simplicity and immediacy. In other words, the application aimed to provide flexibility in the creation and telling of the stories, giving children more freedom to move around and play without any instructions. The field study revealed that TellTable fostered the children's creativity. They enjoyed their experiences, and their stories became a way to broadcast their identities within the school community, through being photographed, having their voices recorded, and having their stories saved on the library laptops.

2.5.4 Theoretical underpinnings: Theories of social development

Since software design on an interactive tabletop for play therapy was the core part of this research, and since there was no framework within the counselling field for NDPT software design, it seemed reasonable to investigate how digital applications were designed for tabletops in an educational context. As shown in the previous subsection, people have begun to research and use interactive tabletops in the educational context partly because they promote collaboration and sharing. Such a use of tabletops is based mainly on the theories of children's social development proposed by Bandura (1977) and Vygotsky (1978). Although these educational theories do not have direct links to NDPT and Rogerian counselling, they were the only existing bases from which I could begin to explore how to design for the field of play therapy. It was through understanding the affordances of tabletops (e.g., Face-to-face interaction) in

relation to Vygotsky's concepts (e.g., collaboration) that I could establish further links between tabletops and NDPT (e.g., how a Face-to-face opportunity may support the building of a *Warm and Friendly Therapeutic Relationship*). In other words, I used the educational theories of Bandura and Vygotsky as building blocks for the design and investigation of the use of tabletops in NDPT.

Further, since this Phd originated in the School of Education, Communication and Language Sciences, which is partly grounded on the Human-Interaction field that in general may be said to use Vygotsky's theories for application design on interactive tabletops, I was constantly encouraged to explore the educational theories of child development in relation to NDPT. Clearly, Roger's theory of personality is the source of NDPT. Nevertheless, child development theories have a strong relevance to the process of play therapy and can be used to view NDPT from an additional angle. In light of this, I took up the challenge of exploring and underpinning the links between child learning, psychoanalytic and development theories and the affordances of interactive tabletops. This subsection reflects the initial stage of this research: exploring the theoretical basis for the use of interactive tabletops in an educational context – the learning theories of Bandura and Vygotsky.

The behaviourist Albert Bandura believed that our behaviour can influence our environment, a process that he called reciprocal determinism. He also believed that psychological processes influence our personality (Boeree, 2006) and that these psychological processes consist of the interaction between language and the ability to form mental images on the one hand and the environment and our behaviour on the other. He suggested that learning occurs through observation and imitation. For observational learning to occur, the four following processes are needed: attention; retention; motor reproduction, and motivation or reinforcement.

Attention. It is only when an individual pays attention to the model of a particular type of behaviour that he or she is able to learn that behaviour. In addition, to increase the likelihood that the learning will take place, the behaviour under focus has to be attractive and prestigious in the eyes of the learner.

Retention is an ability to encode and recall the behaviour. The less attention is paid to the model behaviour, the harder it will be to remember and recall it later. Before recalling the behaviour, a child encodes it as an image or a verbal schema. Since young children's language ability has not yet developed properly, their imitation of the learned behaviour relies heavily on stored visual images. *Motor reproduction* refers to the children's ability to reproduce the types of behaviour they have learned if they possess the physical skills required to do so. The process of motor reproduction can occur through either physical or mental practice.

Motivation or *reinforcement* has to be present for the child to want to learn the modelled behaviour. It is the driving force for learning to happen and, if absent or limited, the result is poorer attention, retention and motor reproduction. According to Bandura, the effectiveness of learning depends greatly on observation, imitation and modelling. It can be argued that interactive tabletops are a perfect platform for encouraging these processes, since they enable a group of students to stay in physical proximity and easily observe and interact with one another. During this process of collaboration, students have a chance to imitate, model and learn from one another, which has been shown to improve learning outcomes (Kharrufa, 2010).

Lev Vygotsky, the Russian psychologist and social constructionist, built on the theories of Piaget and Bandura. Unlike Piaget, however, who believed that children had responsibility for their own cognitive development, Vygotsky (1978) proposed that child development is a result of social forces. According to him, cognitive development is shaped and advanced through our interactions with each other (Roffer, 2006). Therefore, people of different ages require different levels of support from the environment. Vygotsky studied Bandura's theory and the relationship between social interaction, cognition and language. As a result he suggested that cognitive development is the outcome of social learning. A major principle of Vygotsky's theory, which is also relevant for the application of interactive tabletops in education, is the notion of a Zone of Proximal Development (ZPD). This is defined as the difference between one's actual and one's potential development. Vygotsky (1978) proposed that learning

and development occur when the ZPD is continually raised, following the achievement of each lower level of independence. He believed that a child can achieve a higher level of independent functioning through play and support from the environment by rising from a lower to a higher level in through the above process. Roffer (2006) acknowledges the potential benefits of including the concept of the ZPD in video and computer games, making tasks just above the individual's ability to achieve. In this way, increasing difficulty within the levels of a game will motivate the person to do more and better, thus providing them with learning opportunities to master additional skills. This is one of the ways to investigate how computers can be used in therapy (Roffer, 2006).

Another aspect of Vygotsky's theory frequently referred to in education is the concept of a More Knowledgeable Other (MKO), a person who has more knowledge or higher ability than the learner and who can support the latter during a ZPD stage. In an educational context, the MKO may be the teacher, peers or even a specially designed form of technology. Again, interactive tabletops seem to be a perfect tool that allows for the creation of ZPDs in the form of educational applications as well as creating a collaborative environment where peers may become each other's MKOs and obtain necessary support in a friendly environment.

2.6 Part 3: Interactive tabletops in non-directive play therapy: a conflict or an opportunity?

The first part of this chapter contained an exploration of play therapy, while Part 2 introduced interactive tabletops and an outline of the theoretical underpinnings and research evidence for the advantages they have to offer. With a view to demonstrating how and to what extent interactive tabletops may be useful in NDPT, Part 3 begins by identifying the differences between the theories used in non-directive play therapy and the theories underpinning the use of interactive tabletops in education, namely those of Piaget (1952) and Vygotsky (1978). This section also raises the question of whether it is possible to use these theories in conjunction with the views of Bowlby and Erikson to understand how child development could take place if an interactive tabletop was used as part of a non-directive play therapy session. I demonstrate how the

existing theories, when combined, may provide a useful framework for understanding as well as guiding research into the use of multi-touch interactive technology in non-directive play therapy.

2.6.1 Comparative analysis: Piaget versus Vygotsky

Because of the multidisciplinary nature of this piece of research, I was given a great deal of encouragement by the academics and researchers at the School of Education, Communication and Language Sciences, as well as those at the Department of Human-Computer Interaction to explore the links between learning theories and NDPT. I started my exploration with a comparative analysis of the theories of Piaget and Vygotsky in order to understand the main differences between the two schools of thought.

First of all it is essential to note that both Piaget and Vygotsky made a valuable contribution to our understanding of child development. While Piaget's ideas were rooted in biological factors and the value of self-direction, Vygotsky focused on the importance of social impact and the influence of culture on children's cognitive development (Figure 5). In other words, Piaget believed that a child's cognitive development results from the child acting within its environment guided by self-directed biological forces influenced more by the latter than by social interactions with others. Vygotsky, on the contrary, focused on dialogue as the main vehicle for development and believed it to be the tool that develops individualised thinking through the internalisation of thoughts during social interactions with others.

Interestingly, Piaget emphasised discovery learning with little teacher intervention, but opportunities for creativity and symbolic play needed for the processes of assimilation and accommodation by which cognitive development was thought to be achieved. Vygotsky took a completely opposite view and emphasised the idea of the more knowledgeable other (MKO), an active teacher, who can help and guide a child to achieve his full mental development through scaffolding and feedback. The main contrast between the two theories lies in the differing values attached to the various factors in the child development process: Piaget's theory being based on the idea that a child

develops through the processes of maturation, discovery methods, assimilation and accommodation, while Vygotsky's theory sees culture and language as the essential tools for development.

	Piaget	Vygotsky
Child cognitive development is	biologically oriented/	culture & social interaction dependant;
Cognitive development is the result of	child acting in its environment/	dialogue during social interaction with others;
Social interaction is the means to	move from egocentrism/	develop individualised thinking through engaging in internalisation of thoughts;
Main factor necessary for healthy development	creativity/	social interactions, Zone of Proximal Development, More Knowledgeable Other;
Learning occurs with	little teacher intervention/	guided discovery in the classroom;
A teacher's role is	a facilitator/	an active provider of scaffolding & feedback;
A problem beyond the child's understanding can be solved when	the child is ready/	with proper help and assistance from MKO;

Figure 5. Piaget & Vygotsky

2.6.2 Implications for non-directive play therapy

Having identified the differences between the two main schools of thought, it is pertinent here to raise the question of what this means for non-directive play therapy and research into interactive tabletops. However, before starting this discussion, it is appropriate to remind the reader of one more thing. It has already been mentioned that NDPT originated on the basis of humanistic psychology, with Roger's theory of personality at its core. The following discussion is therefore necessary because of the interdisciplinary nature of the research, which was conducted in the fields of both Counselling (based in the School of Education, Communication and Language Sciences) and Human-Computer Interaction (discussed in more detail in the previous section). Therefore, the reader is encouraged to keep an open mind and remember that this is an exploration and an attempt to understand application design and the use of interactive tabletops in relation to child development theories in play therapy, with the help of the educational context within which software on interactive tabletops is widely used for learning purposes.

It is essential to note the importance of Vygotsky's (1978) ideas for the educational context and more directive therapies. Since direction and scaffolding are needed for children's cognitive development, which is achieved through guided practice and collaborative learning, it is obvious why Vygotsky's ideas are so popular and widely used in those research and practice areas. This also explains why Piaget's theory, one of the bases of NDPT, being focused on self-direction, symbolic play and the creativity needed for assimilation and accommodation, has not been so popular when designing applications for learning and directive therapies. In addition, it is difficult to disagree that the implementation of the concept of self-direction in the digital application is quite challenging in itself and needs a great deal of consideration on the part of designers.

Although it may seem that, since it emphasises self-direction, Piaget's theory is mainly applicable for non-directive therapies, while Vygotsky's theory

fits educational and directive therapy contexts perfectly, this may not necessarily be the case. Such a hasty conclusion presents the picture of two clear-cut schools of thought in opposition to one another. The aim of the following discussion is to challenge this view and demonstrate how Vygotsky's concepts may be used as a guide to understanding the context of NDPT. In addition, it will be demonstrated how the psychoanalytical theories of Bowlby (1980) and Erikson (1959) supplement current NDPT theory and make it more comprehensive. Finally, based on the theoretical framework thus outlined, the potential benefits of interactive tabletops for NDPT are demonstrated.

Therapeutic Relationship

I will now review the core principles of NDPT outlined by Axline (1947) and argue their relation to the theories discussed above. I will raise the question of the usefulness of interactive tabletop affordances for NDPT in relation to its theoretical underpinnings.

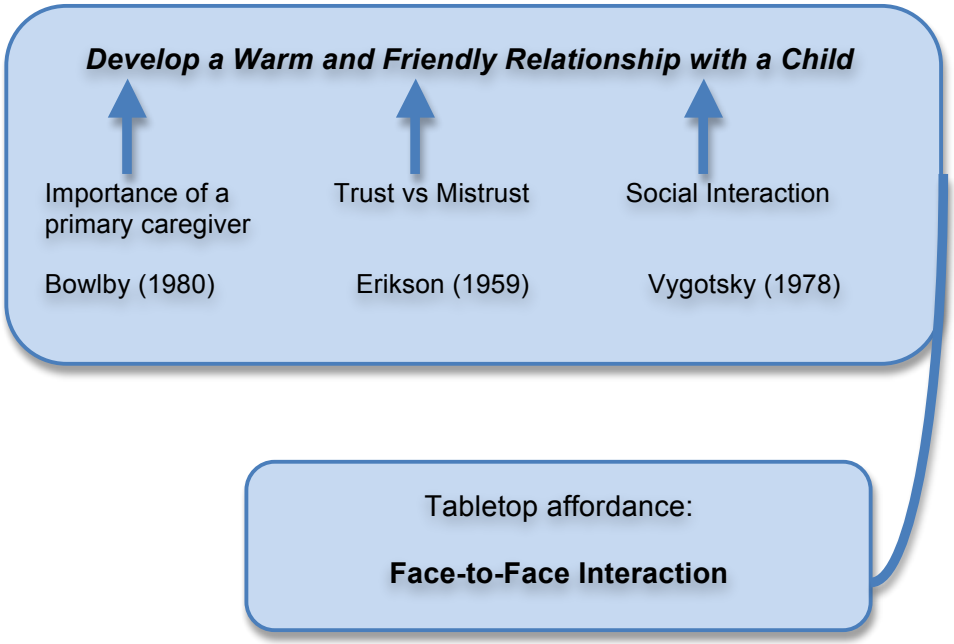

Figure 6. Relevance of child development theories and tabletop affordances to NDPT *Principle 1*

The relevance of Bowlby (1980) and Erikson's (1959) ideas for NDPT were discussed in detail in section 2.3.2. Indeed, knowledge of the child's primary attachments enables therapists to understand why the child might relate to them in a particular way. Since relationship is the core of NDPT, if the child developed an atypical form of attachment, it may hinder the development of a trusting relationship with the therapist and thus make the child feel unsafe/unwanted. This, in turn, may hold back therapeutic progress, since feeling safe is necessary for exploration and self-expression.

Surprisingly, Vygotsky's ideas on the value of social interaction are directly linked to Axline's ideas on the essential role of the child/therapist relationship. In the Merriam-Webster dictionary, 'relationship' is defined as 'the

way in which two or more people, groups, countries etc. talk to, behave toward, and deal with each other'. The concepts of relationship and interaction are therefore similar, since the latter means 'the activity of being with and talking to other people and the way people react to each other' (online Macmillan dictionary). Interaction, however, may occur between two strangers and can be non-lasting. A relationship, on the contrary, requires continuity and implies a degree of emotional attachment between two people. As opposed to language, which is the vehicle of interaction according to Vygotsky, the emotional component is the basis for child/therapist interaction. This is partly because the language ability of young children lags behind their emotional development, and partly because the therapeutic relationship is based on unconditional positive regard, acceptance and understanding, feelings and beliefs, which can hardly be put into words. Despite the different means of conducting interaction - verbal or non-verbal emotional - Vygotsky's view on the importance of interaction for child development is reflected in Axline's ideas on the relationship necessary for successful therapy.

Interactive tabletops have been shown to be the platform for promoting collaboration through encouraging verbal interaction between learners. In other words, by sharing the space and working on activities together, children internalise language, which aids in the development of reasoning skills and thus in the development of their cognition. The question to ask is whether the affordances of interactive tabletops could facilitate the sort of interaction between a child and a therapist that could develop into a warm and friendly relationship. This interaction around the interactive tabletop may not necessarily be based on language but could be based on the sharing of emotions and feelings between child and therapist, since unconditional acceptance, full presence and positive regard during the process of sharing of play activities are just as necessary for healthy development as verbal interaction.

Unlike traditional computers, interactive tabletops that allow for face-to-face interaction could possibly become the first computerised tool to create an opportunity for a child and a therapist to build a relationship, since they do not

exclude the therapist but instead enable child/therapist interaction. There are two other reasons why interactive tabletops could be useful in NDPT. First, technology has already been shown to increase a child's motivation (Brooks & Peterson, 2005). Secondly, the therapist will be obliged to use the tabletop application as well, and since the sort of technological toys available on the tabletop are already familiar and interesting to children, the fact that the therapist will be obliged to use them as well will help the child to trust him or her.

Unconditional acceptance & permissiveness to express anything

It may also be argued that the NDPT principles of unconditional acceptance and permissiveness to express anything outlined by Axline (1947) are also related to the theories of Piaget (1952) and Vygotsky (1978).

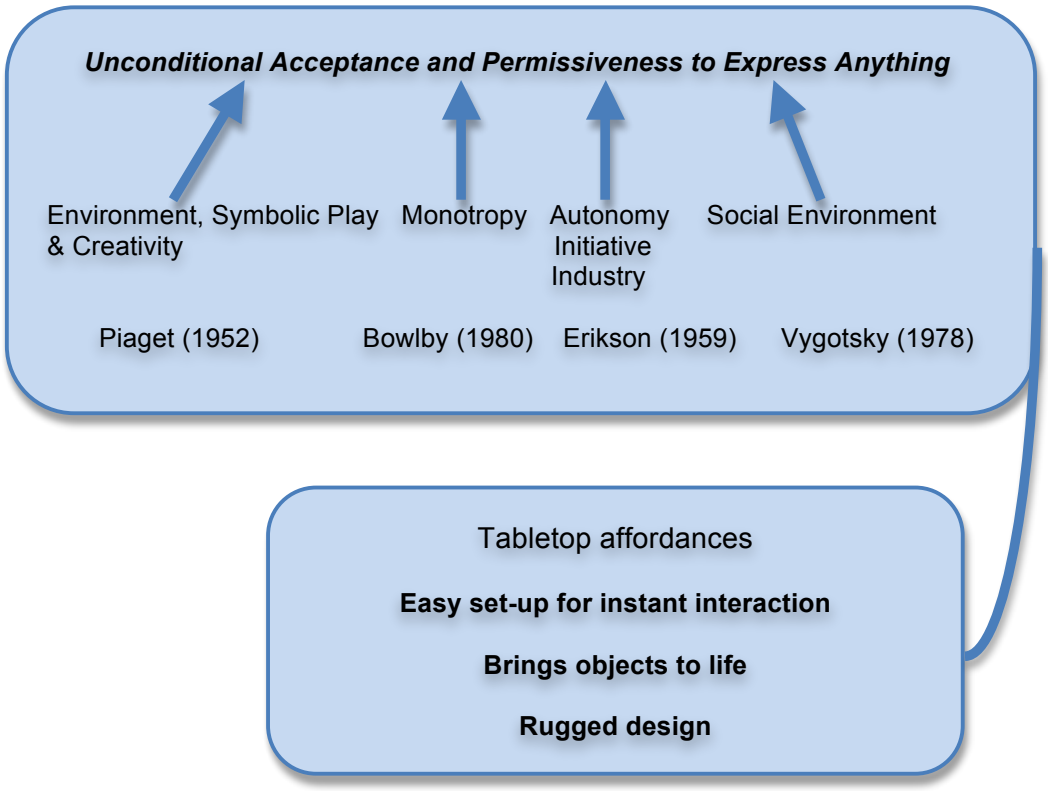

Figure 7. Relevance of child development theories and tabletop affordances to NDPT *Principles 4 & 6*

Piaget's central idea is that children develop self-centric theories about their environment, things and people in that environment based on their own

experiences with those people/environments, but only when they are ready and sufficiently developed biologically. Vygotsky, on the contrary, argued that the social environment is the cause of a child's development. Both viewpoints seem to be relevant to NDPT: no matter what comes first, both readiness (that is the child's cognitive and emotional abilities to comprehend, explore and process presenting issues) and experience of the environment are needed for a child's healthy development. Since people are part of the environment, the value of care-givers' presence and participation in a child's development can hardly be overestimated. To build on Piaget's ideas on the value of the environment for cognitive development, Bowlby (1980) believed in the essential role of the attachment figure for the child's healthy emotional development (discussed earlier in section 2.3.2) Indeed, Bowlby's ideas on monotropy, the value of the bond with one primary attachment figure, are an excellent illustration of the importance of a caring person in the child's environment for emotional development.

Vygotsky (1978), Piaget (1952) and Bowlby's (1980) views on the importance of the environment for a child's healthy development are also the core of humanistic psychology and thus NDPT. Carl Rogers (1951), the founder of humanistic psychology, on which NDPT is built, emphasised the role of environment in a person's healthy functioning and well-being. He believed that for a people to 'grow', they need an environment that provides them with genuineness (openness and self-disclosure), acceptance (being seen with unconditional positive regard), and empathy (being listened to and understood). Without these, relationships and healthy personalities will not develop, as they should, much as a tree will not grow without sunlight and water. Being a part of the child's environment and experience, a therapist who exhibits unconditional acceptance, positive regard, understanding and care creates the so-called 'right conditions' for the child's self-healing (Rogers, 1951). Experiences of neglect or a deficient amount of attention, of mistrust or resentment may be worked through by having a new positive and safe environment/relationship. Therefore, it is essential for the child to have an environment from which she can benefit.

In addition to having caring adults, the therapeutic environment should allow children to express anything they like by using the appropriate toys and materials (Axline, 1947). Opportunities for symbolic play and creativity also become a necessary part of the environment to enable the processes of assimilation and accommodation, which in NDPT enable the child to re-work cognitive and emotional schemas.

Interactive tabletops seem to be able to serve the function of expanding a child's self-expression through enabling him to bring objects to life, capture images and record objects as well as exercise creativity in a new way. The easy set-up for instant interaction and rugged design can give children the freedom they need to express what they want in an easy and simple way. The permissive environment, in which children are the masters, can help them work through feelings of shame, guilt and inferiority (Landreth, 2002). The simple use of technology can possibly help a child progress to the feelings of autonomy and initiative so necessary for healthy development (Erikson, 1968). Sturdy toys that are predictable and reliable are especially needed to avoid the child's frustration and disappointment. Taking into account children's need for joy and pleasure, and considering the reliability of technology, interactive tabletops may help the child move from overdependence on outer recognition to inner satisfaction and enjoyment, which is another ingredient of healthy development (Erikson, 1968).

Recognise and reflect the feelings of the child to create understanding for the latter

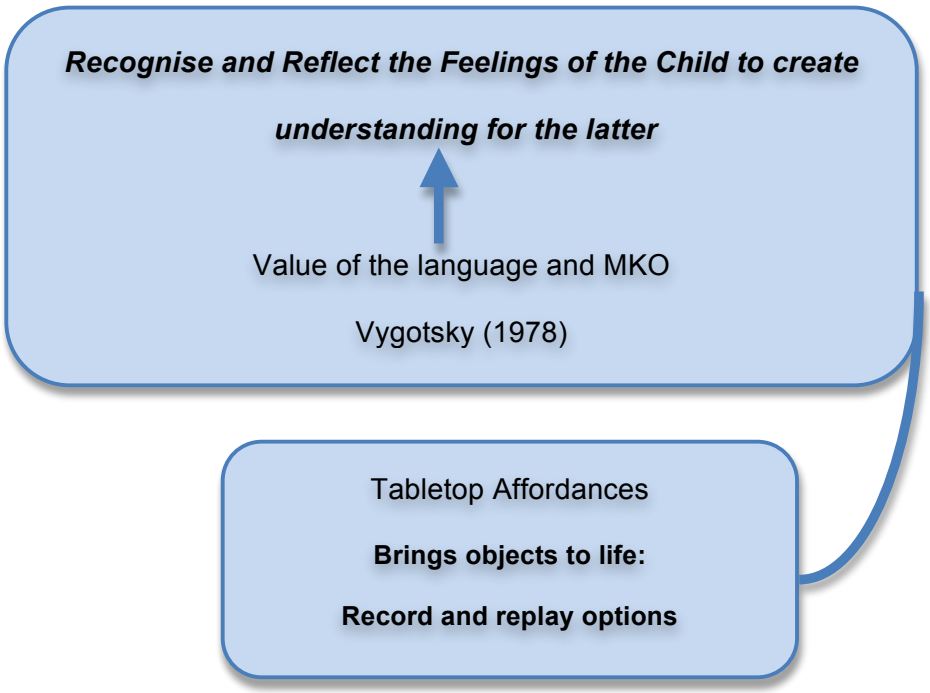

Figure 8. Relevance of child development theories and tabletop affordances to NDPT *Principle 8*

Vygotsky (1978) believed that language is the core of children's cognitive development. As discussed earlier, he suggested that the language used during social interactions is internalised, leading to an increase in inner reasoning skills, which in turn results in the improvement of higher order thinking skills, which are the basis of cognitive development. A challenging task, as the means to establish the necessary environment to reflect idea of ZPD in the presence of a More Knowledgeable Other, therefore, becomes an opportunity for social interaction, increased reasoning and development of cognition.

Although language is not seen as being of prime importance in NDPT with young children, its value seems to be quite relevant to the idea of reflective listening in humanistic psychology and NDPT. Reflective listening is a method of communication that involves the therapist seeking to understand the client's ideas, then offering them back to the speaker in the same words. The language

in this case serves as the means of enabling the speakers to hear their own perspectives and explore their understanding, beliefs and feelings further.

In other words, during social interaction in the NDPT context, children externalise their feelings and ideas; the therapist reflects them back to them in exactly the same language; this creates an opportunity for children to internalise what they hear in order to explore their feelings further and talk about things more in greater depth (Rogers, 1951). In this context, the therapist could be compared to the MKO, with the important distinction that he or she does not direct the cognitive understanding of the child but does provide the necessary verbal feedback as well as the emotional safety and empathy essential for reflective listening. Rogers (1951) believed that the results of this practice are the establishing of a connection with the emotional roots of the troubling issue, the initial exploration and diagnosis of the problem, the resolution of a conflict by identifying new avenues of action (Fisher, 1981), and of course the improvement of the child's emotional state. Therefore, Vygotsky's ideas on the value of language for cognitive development could be used to understand Rogers' viewpoint and the core principle of NDPT for children's emotional well-being.

With regard to our discussion on the use of technology Vygotsky's ideas on the use of language, can nevertheless be used as a guide to understanding the role played by the spoken word in child development in a therapeutic session conducted through the means of a computerised toy. Interactive tabletop affordances such as the recording and replay of child's language and play can potentially be helpful for the process of reflective listening. They can also support the NDPT therapist's skills outlined by Landreth (2002): tracking; reflection of content; reflection of feeling, and enlarging the meaning. It is, however, yet to be determined how therapists and children could benefit from the technological possibility of recording the language used and playing it back to the child.

Returning Responsibility to the Child; Letting the Child Lead; Recognise Gradual Nature of Therapeutic Process

NDPT emphasises the child's ability to know from within what is needed for inner growth and emotional healing (Axline, 1947). The therapist's role, therefore, is to respect children's ability to solve their own problems and not direct or hurry the therapeutic process by any means. In this context the child is as much a More Knowledgeable Other as the therapist. While the child leads the way and sets the direction of the therapeutic process to resolve the challenging issues he or she faced with, the therapist is keeping the child safe (setting the limits that are necessary) and cared for during this time, which results in an equally valuable contribution to the therapeutic process being made by both the child and the therapist.

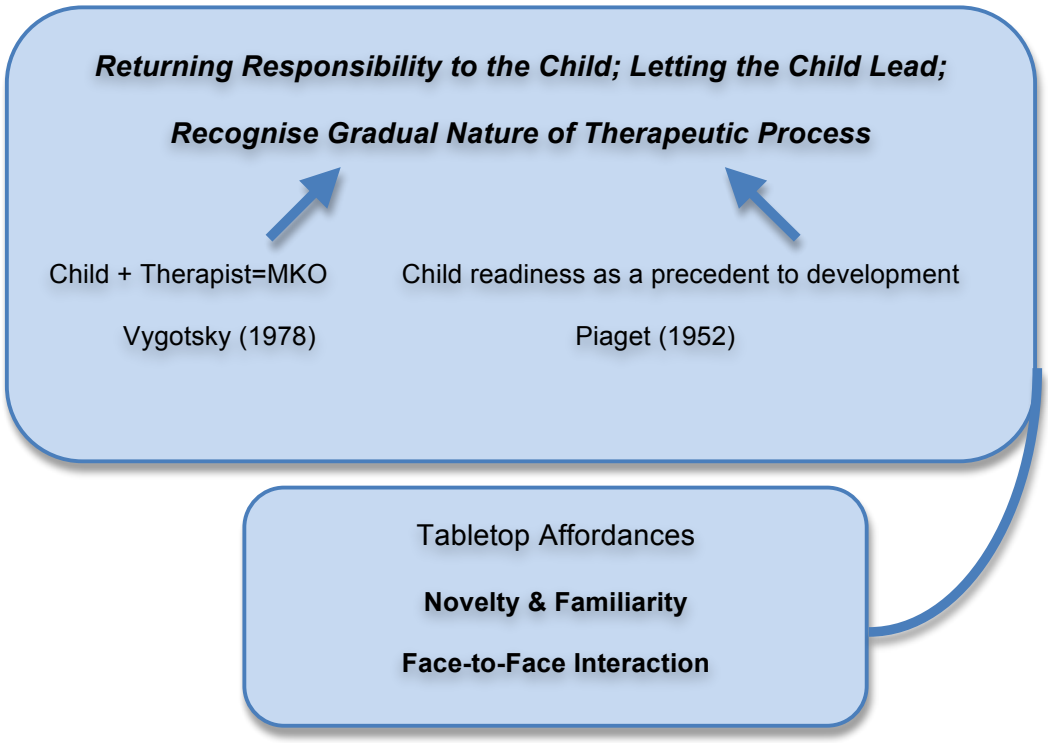

Figure 9. Relevance of child development theories and tabletop affordances to NDPT *Principles 2, 3 and 5*.

Surprisingly, NDPT intervention and the presence of the therapist may not necessarily be enough for therapeutic change to occur. As the recent literature (World Health Organization, 2003; Warda et al., 2003; Clarke, 2011) emphasises, the concept of 'readiness to change' is a crucial factor. Readiness to change is a concept which may apply to either the client's ability or the therapeutic situation, since both are likely to promote engagement in therapy and thus enable therapeutic change (Howells & Day, 2002). As Warda et al. (2003) state, to be ready for therapy means that the person is motivated (has the will to), is able to respond appropriately (perceives he or she can), finds it relevant and meaningful (can engage), and has the capacities (is able) successfully to enter the treatment programme. Indeed, studies have shown that in adults, higher levels of readiness to change were linked to better psychological functioning (Clarke, 2011) and best responses to treatments, regardless of modality (Lewis et al., 2009).

These research findings support Piaget's ideas on children's readiness being the necessary precedent to their development. The NDPT concepts of self-direction and the gradual nature of the counselling process may serve as a means of allowing children to 'get ready' at their own pace in their own time, without being pushed or pressured. Given the novelty of and children's interest in technology, interactive tabletops may increase the probability of children's engagement in the therapy and thus possibly increase their readiness for therapeutic change. First of all, as a therapeutic tool, technology can motivate a child to enter the therapy. It is a familiar tool, which children find relevant, meaningful and easy to use. Therefore, this tool may contribute to a child's readiness to engage in therapy and achieve the desired therapeutic change.

In addition, the quality of the therapeutic alliance is associated with the child's readiness to change. In other words, the better the child/therapist relationship, the higher the probability of therapeutic change occurring. To this end, as discussed earlier, face-to-face interaction around an interactive tabletop can aid in the development of the therapeutic alliance, and once again help the child work through the presenting issues.

Summary

Since there are principles and guidelines, but not a comprehensive theoretical framework upon which NDPT is built, the aim of Part 3 of this chapter was to demonstrate how existing theories of child development could help deepen our understanding of the context of NDPT. Several, sometimes seemingly opposing, theories of Piaget (1952), Erikson (1959), Bowlby (1980 and Vygostky's (1978) were discussed, and it was argued that they have relevance for NDPT. It was also argued that interactive tabletops might become a helpful therapeutic tool as they seem to be suitable for NDPT and the theories in which it is rooted.

2.7 Concluding thoughts

Computers have undergone a rapid development since they were first introduced for individual use in everyday life. Large desktops were replaced by smaller but faster mobile laptops, and a new generation of computers with a horizontal displays and simplified multi-touch interaction emerged. Interactive tabletops (including the SMART tabletop specifically designed for use with children in educational settings) have been widely developed in the field of human-computer interaction to support face-to-face collaboration, peer work and the promotion of children's cognitive development. However, few studies have investigated how technology could support therapist/child interaction in a one-to-one therapeutic session.

Further, although technology has been demonstrated to enable creativity through storytelling and fantasy play, the elements upon which play therapy is based, little is known about how technology could support creativity in a therapeutic setting. As outlined earlier, interruptions in the relationship, dependence on the therapist's instructions and frustration resulting from the technology breaking down are the main reasons why technology should not be used in non-directive play therapy (Carmichael, 2006). Interestingly, the affordances of the SMART tabletop make it very different from traditional computers, allowing for face-to-face interaction, easy use without instructions

even for very young children, and use without any fear of damaging the technology.

Therefore, this raises the question of whether SMART interactive tabletops, as a new generation of computers, may meet the needs of non-directive play therapists, and could potentially become the first computerised toy in the play therapy room. With most research having been conducted in the field of human-computer interaction, there is a great deal of enthusiasm about but few studies on the interaction with the tabletop itself. There is thus little empirical evidence on the impact of interactive tabletops on participants and especially on the therapeutic process itself. In addition, there is a lack of design guidelines as to how applications could be designed to promote activities such as storytelling, fantasy play and creativity in therapeutic contexts, when interactions must also support the therapeutic relationship. The aim of the present study was thus to fill these gaps in the research.

CHAPTER 3. METHODOLOGY

'Thinking is easy, acting is difficult, and put one's thoughts into action is the most difficult thing in the world'
~ Johann Wolfgang von Goethe

3.1 Introduction

In this chapter the aims and research questions, and the research design and the conceptual framework upon which it was based are discussed. The methodology of focus group and individual interviews, questionnaires, and video observations are explained. The ethical issues that arise when young children become participants in research are also discussed. The chapter also provides details of which type of data were collected at different stages of the research: design, interface usability tests, mock therapy, pilot study and real world deployment. Finally, the reasons why and the way in which deductive thematic analysis was utilised are presented.

3.2 Research Aims and Questions

As mentioned in the Introduction, the particular affordances and features possessed by interactive tabletops suggested that they may be suitable for use in non-directive play therapy. Therefore, the main aim of this research was to establish a paradigm for understanding how, if at all, applications on an interactive tabletop could support non-directive play therapy (Figure 10). Since hardly any studies had explored this issue and since no applications had been previously designed specifically for use in non-directive play therapy, the aim in this research was consequently to formulate design guidelines and develop an application for an interactive tabletop for use in non-directive play therapy with children. The following research questions were derived from these aims:

Question 1

How, if at all, could an application on an interactive tabletop be designed to suit the non-directive play therapy framework?'

Question 2

How, if at all, could a novel digital toy like Magic Land on an interactive tabletop support non-directive play therapy?

3.3 Research Design

This interdisciplinary study originated from and is positioned between two disciplines: Counselling in the school of Education and Human-Computer Interaction field, and therefore combined two research designs: development research and an exploratory case study. It also adopted the principles of interpretivism in both developing the application and establishing the basis for understanding how it could support non-directive play therapy on an interactive tabletop in practice. Since the study was concerned with understanding the process and the usage of technology, qualitative methodology was employed as a strategy of inquiry to collect suitable research data, including focus groups with therapists, interviews with children and video recordings for qualitative data analysis.

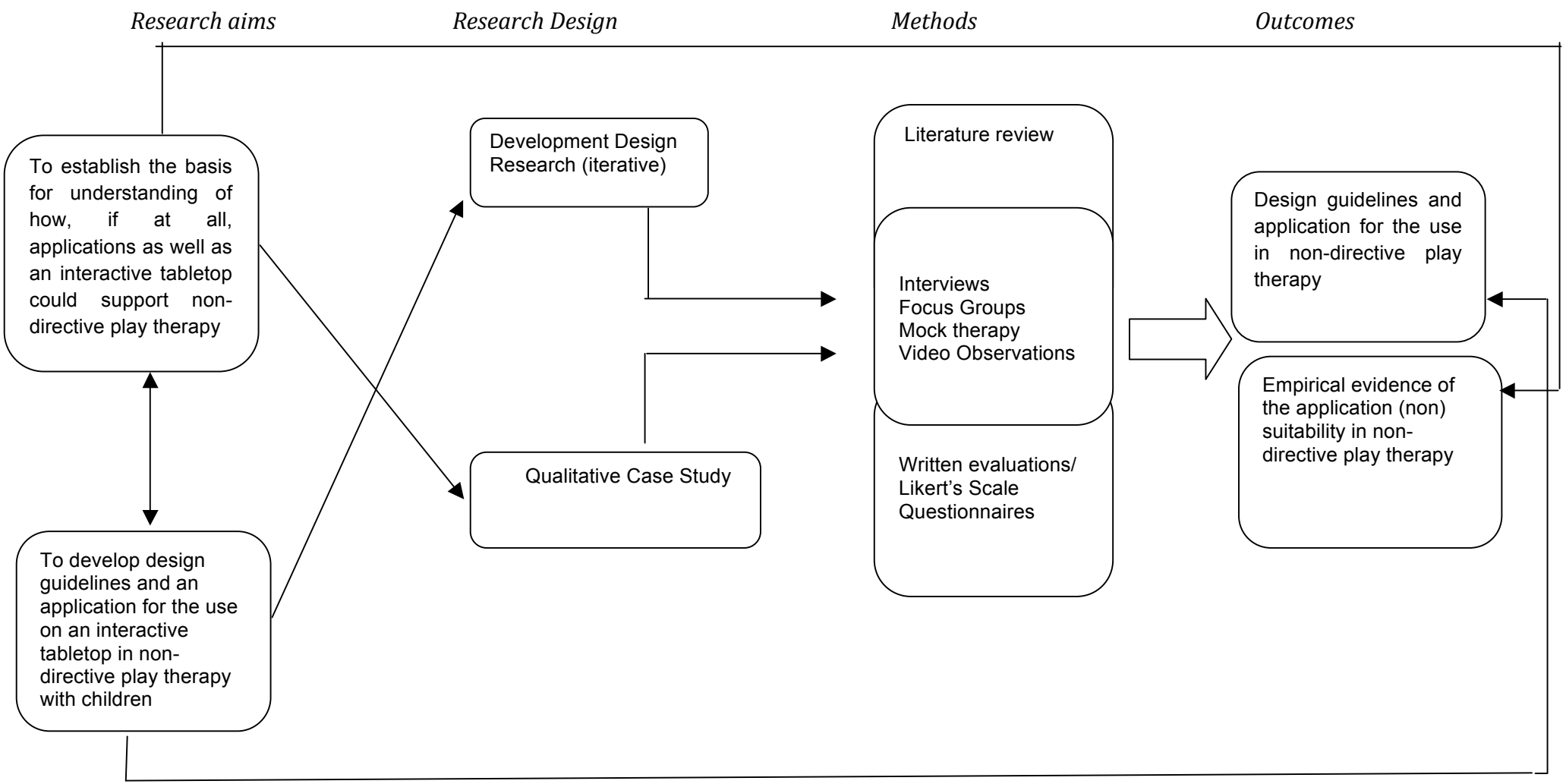

Figure 10. Research design

3.3.1 A conceptual framework and a philosophical paradigm

This study adopted non-directive play therapy principles (Axline, 1947) as the basis for understanding and exploring the context of NDPT (discussed in section 2.3). As shown in Chapter 2, these principles are related in a number of child development theories (Piaget, 1952; Bowlby, 1980; Erikson, 1963) as well as some concepts of social development theory (Vygotsky, 1978). I demonstrated earlier (Chapter 2, subsection 2.3.2) how various concepts of these theories are linked to NDPT principles and I will now summarise the main links among them. These principles, together with those concepts, were used as a theoretical framework for the current research (Figure 11).

First of all, the first NDPT principle of a *Warm and Friendly Relationship* is closely linked to and could be explained by such theoretical concepts as social interaction (Vygotsky, 1978), trust (Erikson, 1963) and attachment formation and development (Bowlby, 1980). The latter also underpins the second and third principles of NDPT: *Unconditional Acceptance and Permissiveness to Express Anything*. In addition, these principles embed such concepts as symbolic and creative play, which is necessary for the processes of assimilation and accommodation (Piaget, 1952). Further, a concept of autonomy/initiative and industry (Erikson, 1963) contributes to understanding how the child expresses himself and what might prevent his self-expression and play.

Such ideas as the value of the language and a MKO (Vygotsky, 1978) contribute to understanding the principle of *Recognition and Reflection* of the child's feelings. They also provide a working frame for understanding such NDPT principles as *Letting the Child Lead*; *Recognising the Gradual Nature* of the therapeutic process and *Establishing Necessary Limits*. Finally, Piaget's (1952) ideas on self-direction and inner readiness for development underpin the NDPT principle of returning responsibility to the child.

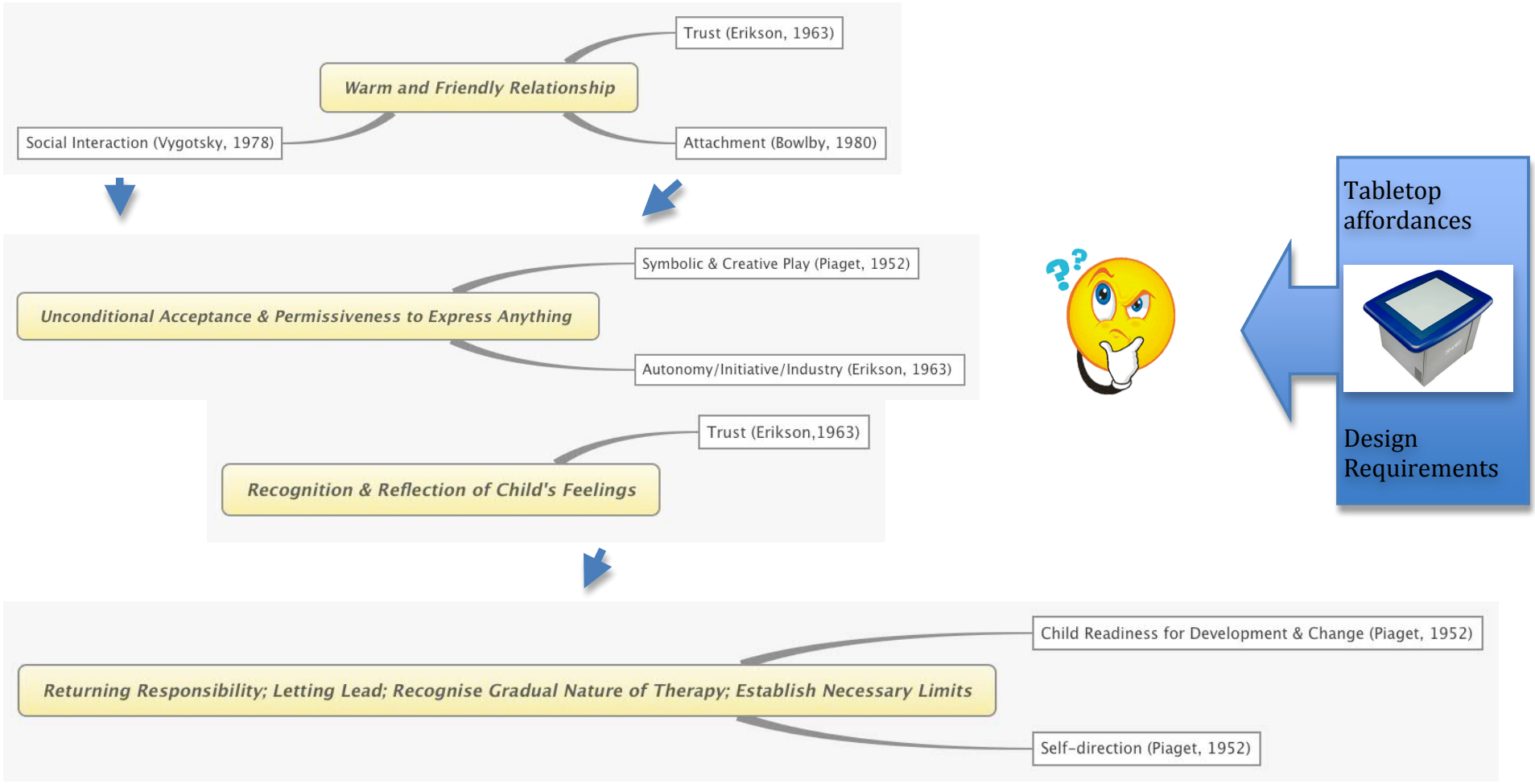

Figure 11. Theoretical Framework

3.3.2. Development Research: Rationale

In order to understand how to design and develop an application for use in non-directive play therapy, this study adopted a Development Research Design. Its general purpose, which was appropriate for the aims of this study, is to develop and evaluate a new system. The adoption of this research design helped, the researcher to cover the stages of literature review, expert consultation, and analysis of examples (van den Akker, 1999). It also encouraged a focus on interaction and collaboration with the research participants to approximate interventions, which allowed the active involvement of play therapists in the design processes, but did not impose expectations on them to know all the answers about what design decisions would have to be made.

Adopting Development Research I applied systematic documentation, analysis, and reflection on the research process and outcomes through the whole system design and evaluation processes. I also drew on some aspects of iterative design, being based on an iteration cycles procedure for the improvement of the prototypes, as recommended by Wang & Hannafin (2005).

3.3.3 Understanding the role of the system: Explorative Qualitative Case Study

The aim of the development research stage was to develop design guidelines and an application for non-directive play therapy. As stated above, the focus of this study was both on establishing a paradigm for understanding the use of the software in relation to non-directive play therapy principles, and on the evaluation of the effectiveness of the product itself. The system was first tested for usability and ‘safe use’ for a therapeutic context, which was followed by a case study. The latter explored the views and experiences of therapists and children with the use of the designed software and interactive tabletops.

The decision to adopt a case study approach resulted mainly from the choice of a conceptual framework of non-directive play therapy, which is based on the principles of humanistic psychology (discussed in section 2.2.4). As mentioned earlier, the latter is concerned with individual subjective experiences and the understanding of self; therefore, a qualitative research approach using open-ended questions that would allow me to obtain in-depth information was preferred to a quantitative methodology (Sammons & Bakkum, 2012). Further, the aim of this research was to understand how to design an application on an interactive tabletop that would support non-directive principles such as a warm relationship, permissiveness to express anything etc. Since these are abstract principles that can be experienced by individuals in different ways and that are not necessarily observable, a quantitative methodology would not fit the research aim.

In addition, Denscombe (2007) outlined the following characteristics of case study design: depth of the study; focus on the particular; relationship/process, holistic view, natural settings and multiple sources of data. Since these characteristics reflect the nature of the present study and its aims (outlined in section 3.2), this is another reason why a case study design was adopted in order to understand the role of the system in relation to non-directive play therapy principles. Finally, case studies have been a widely used methodology for system evaluation in the field of interactive system design. It allows researchers to obtain the views of the end-users and to acquire in-depth information about their experiences as well as about the effectiveness of the designed system itself.

3.3.4 Validity and reliability

In the qualitative paradigm, reliability and validity are conceptualised as trustworthiness, rigour and qualit (Denzin, 1978). In order to eliminate bias and to increase the trustworthiness of the data, I used triangulation. The latter is defined as ‘a validity procedure where researchers search for convergence among multiple and different

sources of information to form themes or categories in a study' (Creswell & Miller, 2000, p. 126). Triangulation of the data was accomplished by obtaining from several different sources (therapists, children and observations) as well as by applying different research methods (questionnaires, audio interviews/focus groups, written feedback and video data). In addition, to ensure the trustworthiness of the data still further, two independent researchers (one of whom was a focus group moderator) were asked to check my interpretation of the transcribed data. Since I played an active role in the data collection and analysis, I also kept a diary documenting a self-reflexive account of my researcher's self (see section 3.3.6).

3.3.5 Limitations

There are several limitations to a case study approach. First of all, although it is appropriate to draw conclusions from the case, the possibility of generalisation is limited owing to the fact that a case study is context-bound. In other words, the findings obtained in this case study may not necessarily be exactly the same if it was to be conducted again with different participants in a different context. This results in the next limitation: the case study may be difficult to replicate. Finally, since the researcher is the primary instrument of data collection and analysis, my own preconceptions and ideas were not separate from but played an active part during all the stages of the research, increasing the bias of the findings.

3.3.6. Reflexive Account of Researcher's Self

Reflexivity is deemed essential in qualitative research to ensure the trustworthiness of the research data (Glesne, 1999; Merriam, 1998; Russell & Kelly, 2002; Stake, 1995) and it is defined 'a method of inquiry, a way of finding out about yourself and your topic' (Richardson, 2000, p.923); or a 'personal tale of what went on in the backstage of doing research' (Ellis & Bochner, 2000, p. 741). In order to eliminate the possibility of bias resulting from my own understanding and ideas, feelings and behaviour, I adopted reflective writing, as recommended by

Russell and Kelly (2002), which gave me an opportunity to become aware of what was allowing me to see, as well as what may be preventing me from seeing. My research journal took the form of short notes and memos, as well as debriefing emails to my supervisors and two independent researchers, one of whom was a moderator during some interviews. Based on these notes, I shall now present and discuss the main points in my personal journey behind the scenes of the research and how it affected the way in which I carried out this study.

Educational background

I have presented my full educational background in Chapter 1. Here I continue the discussion focusing on how my previous experience affected the process of conducting this study.

My notes during the research reflected my worries about undertaking this study as a novice play therapist. My main concern at the beginning of the study was that I did not have enough practical therapeutic experience to conduct this research. Interestingly, as the study progressed I realised that in order to conduct this study I needed the research skills that I had gained while doing my MA more than my years of practice in play therapy. In addition, I noticed that even experienced therapists were not always certain about their ideas and understanding since they had never used this piece of technology in their work before. There were therapists who had worked for years with traditional toys and at times they struggled to imagine how to work with a digital toy in their room. In this sense, being new to therapy had its own advantages: it allowed me to approach this topic with understanding but with an open mind, free from any bias concerning the use of technology in play therapy.

Nevertheless, my concern about not having years of experience in play therapy still affected the way I conducted the interviews. For example, I tried not to assume anything about the therapists' answers, and even when the answer seemed obvious to me (e.g., trust is essential

in play therapy), I would still probe with more questions to underpin a deeper meaning of what was said (e.g. –'Why is it essential'? –'For the child to feel safe'). In other words, although I could guess what the therapist meant, it was still good to check his understanding and whether it was similar to the existing theories in the literature and my own understanding. Moreover, being a non-native speaker of English, I was concerned with the possibility that I may miss information. At times where I was not sure of the meaning of the answer I would say 'My understanding of what you said is.... Is it what you meant?'

I also used an audio recorder to enable me to listen and transcribe the interviews so that I could ensure that I understood what had been said correctly. In addition, two independent researchers checked my interpretations of the transcribed interviews to outline any errors in my understanding of the answers. Therefore, my concerns were shown to be beneficial in practice. It made me employ a few strategies to ensure the validity and reliability of the data collection and data analysis processes.

My research purpose

Many scholars state the importance of choosing a suitable research topic (Denzin & Lincoln, 1998; Glesne, 1999). It is important to know what issues and dilemmas are the most interesting and the most worthwhile (Glesne & Peshkin, 1992). In this respect, my path was already laid out since my 1st supervisor Dr. Sue Pattison had already identified and invited me to the research area that I became interested in. Working with children as a teacher, I have always had a strong interest in child psychology, and an opportunity to practise within the play therapy field was a long desired chance for my career progression.

In addition, play therapy is a newly emerging field in which little empirical research specifically on the application of the technology has been carried out. Given children's interest in technology and scholars' fear of using it in play therapy, this piece of research was needed to

bridge the gap between children's desires to use technology and the therapists' understanding of how children can benefit from doing so in a therapeutic context. Therefore, the following two factors, stated to ensure a choice of the suitable research topic (Denzin & Lincoln, 1998; Glesne & Peshkin, 1992; Wolcott, 1995), guided my decision making process: (i) my own interests and passions, and (ii) the intriguing dilemma that had been identified concerning the usefulness of technology in a therapeutic context.

Impressions and preconceptions

In the previous subsections I presented my educational background and discussed how it influenced my choice of the research topic, the study purpose and processes. In this subsection I briefly outline my main impressions and preconceptions of interactive tabletops, therapists' attitudes toward technology and external expectations, which played an important part in conducting this research.

My initial impression of an interactive tabletop could be summarised in a sentence: a new creative, interesting tool with many possibilities. Interestingly, it is the very same feedback I received from the therapists who participated in this study. This raised a concern for me regarding how objective and unobtrusive I was when conducting the interviews. To deal with this concern, I checked my interview agenda to make sure that I had not used any leading questions (Apendix A). Indeed, since the questionnaires were double-checked by another independent researcher in advance, my preconceptions were not reflected in the questionnaires or interviews.

However, my belief that digital toys are no replacement for traditional toys clearly affected the design process of the application. Firstly, it is reflected in the open-ended interview questions that aimed to explore new potentially beneficial use of tabletops in therapy. Secondly, although some of the therapists' feedback suggested creating digital versions of traditional toys (e.g., puppet play), I kept the focus on those

suggestions related to creating new play activities (e.g., making your own Hero/Avatar or using digital fire and water). These decisions demonstrate my desire to explore new ways of applying tabletops in therapy, rather than simply creating digital versions of traditional toys.

Finally, with increasing interest in new emerging commercial technology and software in the field of education, at times I felt the pressure of high expectations that tabletops would be beneficial for child therapy. Due to this experience I formed two strong stands in this research. Firstly, I made it clear in my own mind that my responsibility as a researcher was to obtain objective and trustworthy findings. I reassured the participants in each and every interview that they were under no pressure to say that the technology supported therapy if it did not. Secondly, I held a strong belief that despite new beneficial ways of using technology independently of the teacher in an educational context (Mitra, 2009), having a therapist who is working with the child is essential in play therapy. Although, the therapists in this study supported my belief, it has still to be acknowledged and taken into account to help the reader understand the lenses through which I looked in this study.

Personal Issues

Patton (2002, p. 35) warns that qualitative research is 'time consuming, intimate, and intense'. Indeed, undertaking this 'ambitious project' (as put by my Progress Panel, 2011), required much time and effort, and on many occasions took over my life. Glesne and Peshkin (1992, p. 173) confirm that '[e]xploring demands near total absorption' and 'qualitative researchers find their lives consumed by their work as they seek understanding and connections'.

I also experienced some health issues during the writing-up stage, which, as noted by my 1st supervisor, affected my thesis. In order not to compromise the quality of the produced work, I obtained a one-year extension to finish this project. Despite all the uncertainties and tensions, I agree with Wolcott (1995), who asserts that in qualitative

research the reward makes it worth the effort. Reflecting on this journey, I have gained much knowledge and developed the necessary skills to cope with the challenges of this type of research in the future.

3.4 Full Ethical Approval

Research ethics provides guidelines for the responsible conduct of research. In addition, research ethics educates and monitors scientists conducting research to ensure a high ethical standard (University of Minnesota centre for bioethics, 2003). The University of Newcastle is committed to the highest standard of ethical practice in research involving or impacting on humans (Newcastle University Research Ethics, 2014). All human research projects conducted at the University by staff and students of the University require approval to safeguard the researcher, the participants and the University.

The current project was no exception. Full ethical approval was obtained from Newcastle University in two stages: (i) for the design of the application and its initial testing in a safe environment with therapists; (ii) for the deployment of the designed software that proved to be safe for the use of children at the initial stages of testing with therapists. All the therapists who participated in this study at the first stage received a Participant Information Sheet and an Invitation Letter for a focus group or one-to-one interview. Further, consent forms were obtained from parents and those children who did not suffer any emotional problems but who took part in interface-usability tests to explore the application for any technical problems that might arise. At this stage, parents and children also received a Participant Information Sheet and an Invitation Letter. During the stages of real-world deployment of the software, therapists, parents and children were provided with the following documents: (i) a Therapist Information Sheet (Appendix B) and a Consent form (Appendix C); (ii) Parental Information Sheet and a Consent Form (Appendices D & E); (iii) Child Information Sheet and a Consent Form (Appendix F).

In addition, I provided a Project Information Sheet for the school and therapy centre where the project took place. I also obtained a Picture Consent (G) from all the participants, according to which the faces of therapists and children in play therapy were to be blurred, with the exception of those children who took part in the interface usability tests and whose parents gave permission for their children's faces to be fully visible. The only adult whose face was not disguised in the pictures was that of myself.

Discussions about research with children have tended to focus on ethics, especially the issues of informed consent and confidentiality (Alderson, 1995; France et al., 2000). Having ensured that the participants received an informed consent, I followed the following steps to maintain the confidentiality of the data: (i) storing audio and video data anonymously and safely on an e-drive specially obtained from the ECLS department in a password-protected computer on campus; (ii) limiting access to the data to the researcher. Finally, at the end of the project the participants were provided with a Participant Debriefing Form (Appendix H) to give them a chance to put into words their experience of participating in this study.

3.5 Research procedures and design processes

Design guidelines play an important role in Human-Computer Interaction (Nielsen, 1993); it was therefore decided to adapt the recently produced (Doherty et al., 2010) design and development guidelines for mental health technologies that are built on the literature in the area as well as on the previous experience of various development projects in the field of mental health. Following these guidelines, the study adopted a five-phase approach sensitive to the ethical issues surrounding the design of applications for mental health interventions (Doherty et al., 2010): (i) design; (ii) interface usability tests; (iii) mock-therapy sessions; (iv) pilot study; (v) a three-month real-world deployment. Therefore, the

study combined both artificial (created situations to assess the safe use of the system) and naturalistic elements (real life tests).

Although Doherty et al. (2010) provided a set of useful guidelines for the design of applications in the field of mental health, there are hardly any guidelines on how to organise and negotiate the work of a multidisciplinary study with programmers involved in the research. Collaborations between departments create opportunities for creative and new ways of approaching research, but at the same time they present a challenge. This challenge lies in the different, sometimes opposite, perspectives on the ways of undertaking a study and on the level of involvement of each of the parties.

In the case of this study, it was very useful to work with a programmer who had a great deal of experience in programming games but who was willing to remain sufficiently open-minded to be prepared to approach the development of software in a new creative way. For example, during the design stage we had a few informal conversations where I emphasised the importance of the software remaining a non-goal oriented game with many free choices and opportunities for the child to be creative. Following our informal talks, I produced a list of design requirements (based on the literature, and therapists' and children's feedback). Also, I provided a set of images to be included in the software together with an electronic and paper prototype of how it would need to appear on the tabletop screen. During these processes we continued discussing each of the prototypes programmed by the programmer to ensure that the work fit in accurately with the design requirements that I had outlined.

However, although I provided a list of design requirements for and improvements to each of the prototypes (based on the data analysis), I encouraged the programmer to participate in some of the data collection to give him 'a taste' and a 'hands on' experience of NDPT which would in turn give him the opportunity to understand more deeply what I wanted to

see in the software and why. For example, the programmer joined some of my focus group interviews and he had an opportunity to watch interface-usability videos with children who had not been referred for therapy. In addition, he took part in a role-play with one of the therapist during a mock therapy session. Clearly, this involvement on the part of the programmer was demanding and time-consuming. This did not, however, seem to be a problem at the time, since he was interested in pursing a Phd in a related area and was keen to use this experience in his future work.

In addition, his involvement was of great support to me in terms of the logistics of the research (e.g., driving, taking tabletops to schools and therapists). There could have been a risk that the greater degree of the programmer's involvement in the research would encourage him to implement his own ideas in the software design, but this was not an issue in this study. The programmer was aware of the necessity for the software to be grounded on my PhD research data, which I was collecting and analysing. Therefore, he adhered to the design requirements and followed the paper prototypes that I had created in order to communicate to him the vision of the software so that he could program in the actual system on a tabletop. The programmers' understanding of the process of implementing my design into a working system, his professional and personal support of the research, as well as his willingness to engage with the therapists, made our collaboration easy and productive.

3.5.1 Research Phases and Context

The first four phases of the research (design, usability tests, mock therapy and pilot study) were done with the therapists in England (n=12), and the final real-world deployment was conducted in Canada (n=4).

Design

During the design phase, six therapists were asked to come to Newcastle University to see the SMART tabletop and participate in the focus group interviews. The rest of the therapists could not join the focus

group interviews because of the commuting distance. The researcher travelled to conduct another focus group interview with four play therapists transporting the SMART table to them. Another two therapists were interviewed individually in person. It was not possible to take the tabletop to them. Instead, they were shown videos of the interactive tabletops specifically recorded for this purpose as well as general videos of tabletops on youtube.

Play therapists were selected to take part if they had a qualification in counselling/psychotherapy and experience of using a non-directive approach in play therapy with children. At the beginning of both a focus group and face-to-face interview, a selection of activities and the capabilities of a SMART interactive tabletop were demonstrated. These activities took the form of pre-existing applications designed to support collaborative learning and included a puzzle and a maths exercise. This created an opportunity for the therapists to experience the technology so as to stimulate their imaginations regarding how the technology might be used in the play therapy setting. The researcher then solicited the therapists' ideas on how such interactive tabletops might support non-directive play therapy. For example, such questions were asked 'What is your first impression of the tabletop?', 'How, if at all, could interactive tabletops be used in non-directive play therapy with primary-school children?', 'What play activities, if any, would you like to see designed for the use of the table in play therapy?'.

In addition, based on the non-directive play therapy principles and the review of categories of toys, the therapists were asked to comment on the first paper prototype, that was further developed into the Magic Land application.

Interface Usability Tests

Eight children aged 4-11 (who had not been referred for play therapy) played in an undirected manner with Magic Land for 30 minutes. Each session was video recorded and analysed for any usability issues.

Since the children had not been referred for play therapy the videos were not analysed to evaluate the extent to which the specific design requirements for play therapy had been met. However, it was the purpose of the usability tests to highlight any technical problems as well as to determine how easy/difficult it was to use Magic Land without instruction, that is, the extent to which its functionality and capabilities were discoverable and the ease with which children appropriated the features into their play.

Mock Therapy

As outlined by Doherty at al. (2010), role-play or mock therapy is a valuable method in medical interaction design. In particular, role-play creates opportunities for therapists to ask questions, clarify issues and increase confidence in using the system before trials in clinical settings (Doherty at al., 2010). Mock therapy is also used as standard practice in play therapy to support training and therefore therapists are experienced and well trained on how to use this technique. Three mock play therapy sessions were used to evaluate Magic Land's appeal and suitability for real clinical contexts. Each play therapist conducted a 30-45 minute video-recorded session with another play therapist, who played the role of a child client. Mock therapy sessions were followed by focus groups and one-to-one interviews. Both the recorded sessions and interviews were analysed using thematic analysis. In addition to verbal feedback, the therapists also completed written evaluation forms to ensure every therapist's view was accounted for.

Pilot study

Having ensured that Magic Land was harmless (based on the interface usability tests and mock therapy sessions) for use in real-life play therapy sessions with children, Magic Land was deployed in a series of non-directive play therapy sessions with primary school children. The study took place in one primary school and involved one play therapist, who used a non-directive approach to play therapy. Five children of primary school age, referred for play therapy sessions, used Magic Land

once a week for 30-40 minutes over a period of two months. During this period, other traditional toy materials (musical instruments, pencils, etc.) brought into the playroom by the therapist were also made available to children. Although parents granted permission for the video recording of the play therapy sessions, the therapist expressed concerns that the video camera could make children behave 'unnaturally'. Given that other forms of unobtrusive observation (e.g., one-sided mirrors) were not available in the setting, these sessions were not video recorded. A semi-structured interview was conducted with the therapist at the end of the deployment to evaluate the final prototype of the Magic Land application from their viewpoint.

Real World Deployment

The real-world deployment took place in an X Child and Family Therapy Centre in Canada. It involved four play therapists and ten children, six of whom were video-recorded, with nine sessions of three children observed by the researcher directly. Each therapy session lasted between 30-40 minutes over the period of three months resulting into twenty video recorded sessions. As in the pilot study, all traditional toys were available for children to use during their therapy (Figure 12).

Figure 12. Play therapy room (real world deployment)

At the end of the deployment two individual interviews with the therapists were conducted. In addition, three children were asked to give their feedback on the use of the system (the same procedure using Non-

Verbal Affective and Likert Scales as in the pilot study described later). The decision to conduct the real-world deployment study in Canada was based on the fact that there were no play therapists available to participate in this study with the video recording of their sessions. Since the researcher's training was conducted through the Canadian Association for Child and Play Therapy (CACPT), the latter was contacted in search of possible participants for the study. The director of an X therapy centre, who is an accredited member of CACPT, expressed an interest in the research and suggested play therapists to participate in this study. The X centre is a children's mental health treatment centre run by a volunteer Board of Directors and funded by the provincial government. The Centre has 12 full-time therapists and 19 Child and Youth Counselors working with children, young people, and their families to improve their mental health and well-being. The Centre is affiliated to many organisations locally, provincially and nationally.

3.5.2 Participants and Sampling

The therapists who participated in this study were recruited by snowball sampling through the Darlington Local Authorities, Play Therapy UK (PTUK), the British Association for Child and Psychotherapy (BACP) and the Canadian Association for Child and Play Therapy (CACPT). Coming from a range of professional bodies of accreditation, to ensure the homogeneity of the participants, the main requirement for the latter was to be trained in and be practising within the non-directive play therapy approach with children of primary school age. Table 1 summarises the therapists' theoretical background, age, gender and years of experience. All the names of participants in this study have been changed in order to ensure privacy and confidentiality.

Research Phase	Therapist's name	Qualifications	Gender	Age group
Design	PT1	British Association of Counselling & Psychotherapy (BACP) Accredited PhD (Education/Counselling) MA Counselling Studies PG Dip Counselling PGCE	female	51-60
	PT2	BA Psychology Diploma in Counselling	female	31-40
	PT3	BA Counselling Studies	female	41-50
	PT4	British Association of Counselling & Psychotherapy accredited Diploma in Counselling	male	51-60
	PT5	BA Psychology	female	41-50
	PT6	Diploma in Counselling	female	51-60
	PT7	BA Counselling Studies British Association of Counselling & Psychotherapy accredited	female	41-50
	PT8	BA Psychology British Association of Counselling & Psychotherapy accredited	female	41-50

Table 1. Participants' background: Design stage

Therapist PT5 also took part in mock therapy sessions and therapist PT 2 was involved in the pilot study. The researcher had no access to the children's background information during the pilot study. It is only known that all five children were of primary school age and referred for play therapy sessions. In addition, since eight children in usability tests were not referred for play therapy sessions and the purpose was to check the system for any faults, there is no background information on the children, except that they were five boys and three girls of primary school age. Table 2 presents the participants background information at the final real world deployment phase.

Research Phase	Therapist's name	Qualifications	Gender	Age group
Real World Deployment	PT9	Canadian Counselling & Psychotherapy Association (CCPA) Training in Play Therapy through Professional Development MA Drama Therapy BA Psychology (Hons)	female	31-40
	PT10	Training in Play Therapy through Professional Development BA Counselling & Social Work	female	31-40
	PT11	Family and Child Therapist Certificate Training in Play Therapy through Professional Development BA Social Work	male	51-60
	PT12	MA Counselling & Psychology Training in Play Therapy through Professional Development BA Counselling	female	31-40

Table 2. Therapists' background: Real World Deployment

Further, there were 11 children who used the application in their therapy sessions. Table 3 shows their ages, presenting problems and the therapist they worked with.

Therapist	Child's name	Child's gender	Child's age	Presenting problems
PT9	Tom	male	6	Speech problems and suspicions of lack of empathy
PT10	Jenny	female	8	Behaviour misconduct & ADHD
	Michael	male	10	Behaviour misconduct
	Lewis	male	10	Attachment difficulties (separating from mother)
	Alex	female	5	Witness of domestic violence
	Jake	male	8	Trauma after physical abuse
PT11	Rick	male	11	Anger management
	Ted	male	5	ADHD, learning difficulties, behaviour misconduct
	Neil	male	7	Behaviour misconduct, aggressive outbursts, suspicions of ADHD
PT12	Emma	female	10	Phobia about storms
	Rayan	male	6	Anxiety

Table 3. Children's background: Real World Deployment

3.6 Data Collection

Since the study adopted a five-phase approach the data were derived from several sources depending on the phase of the research. For the sake of clarity, these data sources are summarised in this section.

3.6.1 Data on Design Guidelines Formulation and Application Development

(i) Literature review: non-directive play therapy principles and categories of toys in therapy reviewed and identified

(ii) Focus group and individual interviews with therapists: the data collected through two focus groups with 10 therapists and two semi-structured individual interviews with another 2 therapists.

(iii) Evaluative written comments from 12 therapists

3.6.2 Data about the Application Usability

(i) Video data: ten hours of video recorded children's play with the purpose of 'debugging' the system to establish its usability

(ii) Children's interviews based on a Likert-scale questionnaire: children were asked how 'easy' and 'good' the application was to use

3.6.3 Data about the Application Being Safe for Therapeutic Use with Children

(i) Video data of mock therapy sessions with play therapists: 3 hours of video-recorded therapy sessions.

(ii) Focus group and an individual semi-structured interviews with therapists.

(iii) Therapists' evaluative comments designed to obtain written feedback on the system as well as to ensure that all therapists had equal opportunities to comment and give feedback.

3.6.4 Preliminary Data on Therapists' Views on the Suitability of the Designed Application for Non-Directive Play Therapy

(i) Therapists' semi-structured interview: the data collected after the pilot study in a primary school with five children.

3.6.5 Main Data on the Application's Suitability for Non-Directive Play Therapy

(i) Therapist Interviews: semi-structured interviews were conducted after four therapists had used the application in their work with children for approximately three months. This resulted into 12 audio-recorded transcribed interviews altogether

(ii) Video Data: twenty videos of children's play therapy sessions were collected over the period of three months;

(iii) Children's Interviews: five children expressed their views on their play with the application;

(iv) Children's evaluative comments based on a Likert scale: five children answered questions on how 'easy' and 'good' their play with the application was.

3.7 Research Methods

3.7.1 Focus groups

The focus group method is 'a form of a group interview in which: there are several participants (in addition to the moderator/facilitator); there is an emphasis in the questioning on a particular fairly tightly defined topic; and the accent is upon interaction with the group and the joint construction of meaning' (Bryman, 2012, p.502). The aim of a focus group interview is to explore individuals' views and experiences on a specific topic through group interaction (Bloor et al., 2003; Puchta & Potter 2004). Therefore, the method combines the elements of both group and focused interviews (Bryman, 2012). The group interaction in the focus group interview is seen as a trigger to produce 'data and insights that would be less accessible without interaction found in a group' (Morgan, 1997, p. 2).

As a social research technique it gained increased popularity back in 1970s (Kuek, 2010) and is still widely used in social science research as a method to uncover the perspectives, attitudes, opinions and experiences of participants. It allows a researcher to find out what the

latter think about an issue and also, more importantly, how and why they think in this particular way (Morgan, 1997). For this purpose participants should have similar educational backgrounds and work in a closely related field. This ensures that they all have the relevant knowledge and necessary experience to discuss an issue presented by the researcher. The length of a focus group interview usually varies from one to one and a half hour and the sessions are audio-recorded to facilitate analysis (ibid.).

There is no general rule about the size of the focus group. It depends mainly on the topic of a discussion and the characteristics of the individuals involved in the interview (Bloor et al. 2001; Puchta & Potter, 2004). Between six and nine participants are suggested (Krueger, 1994) as the most suitable size for the average focus group. Smaller groups of 4-6, however, are recommended for obtaining more in-depth insights by giving the participants sufficient time and equal opportunities for expressing their opinions (Krueger, 1994). Larger groups may be more difficult to handle (Bloor et al., 2001) and make it difficult for more reticent participants to speak up (Peek & Fothegill, 2009). In light of this, it was decided to have groups of 4-6 participants for the focus group interviews in this study.

In the literature there is no consensus on the ideal number of groups needed. There definitely has to be more than one focus group because the findings of a single session may not be sufficiently revealing (Litosseliti, 2003). Krueger (1994) suggests that two groups are sufficient for providing the necessary information and recommends evaluation after the third focus group. Following this recommendation, in this research total of 3 focus groups were conducted during the design and mock therapy stages. In addition, since the study adopted an iterative design, which means that several cycles including the evaluation-refinement-evaluation phases were followed, individual interviews were used to obtain more information and evaluate additional prototypes of the application during the pilot and real-world deployment research stages.

Rationale for use of Focus Groups in the Design Stage

Krueger (1994) states that a focus group interview is a recommended method of data gathering in exploratory or preliminary studies that enables the researcher to acquire general guidelines on how the intervention might operate. It is also used if there is a communication/information gap between particular groups or if the researcher's aim is to uncover factors related to complex behaviours and motivations. Further, focus groups should be used if the researcher wants the ideas, which cannot be generated by lone individuals, to emerge from the group or needs more information to prepare for a larger project. Finally, it is employed if a high value is attached to the opinion of the targeted audience (Krueger, 1994).

The above reasons for using focus groups are in line with the aims of this research: to understand how to design applications for non-directive play therapy and to explore how the application and interactive tabletops suit the non-directive approach to play therapy. Further, since the use of technology is opposed by some in non-directive therapy (Carmichael, 2006), focus groups were favoured as a research method because they allow individuals to argue and challenge each other's points of view (Bryman, 2012). This also allows the researcher to collect more realistic accounts because participants may be forced to revise their views (ibid.).

Procedure

Each focus group followed the steps outlined by Krueger (1994): welcome, overview of the topic, the ground rules followed by questions prepared in advance. The ground rules included only one person speaking at a time with no side conversations taking place among the neighbours in order to ensure the clarity of the recording to enable transcription later. Also, everyone was asked to participate with no one dominating the discussion (Morgan, 1997). Although the questions were prepared in advance, the researcher adopted a less structured approach

to interviewing for the first half an hour of each focus group and a more structured approach for the second half of the interview. This was determined by the different aims for each part of the discussion: for the first 30 minutes therapists were encouraged to brainstorm on how to design and use interactive tabletops in therapy; while during the next 30 minutes they were asked to give feedback on the latest prototype of the application under development.

In other words, during the first part of focus group the questions were open-ended and loosely phrased to encourage a group to spark a discussion among themselves without much of the moderator's direction. As Morgan (1997, p.40) puts it, '...if the goal is to learn something new from the participants, then it is best to let them speak for themselves'. During the second part of the focus group, the questions were more focused and structured, asking for the therapists' feedback on specific features of the application prototype.

During the focus group interview the researcher's aim was to listen for inconsistent comments and probe for understanding using the following techniques (Krueger, 1994): leaving a pause after a participant's comment and requesting more information by asking such questions as 'Would you explain further?', 'Would you give me an example of what you mean?', 'Would you say more?' etc. I also offered a summary of key questions seeking confirmation and paying attention to vague and cryptic comments. In addition, I took notes of background information on the participants and made a summary of the opinions given. A diagram of the seating arrangements was made to ensure that the respondents' answers could be matched to their background information once the data had been made anonymous. At the end of each focus group the participants were asked about their experience of participation and their suggestions on improving the process of conducting the focus group interview by the researcher.

Validity

Focus groups have proved to be an effective instrument for evaluating computer systems in the mental health area (Van Velsen et al., 2008; Mmari, K., 2006). Nevertheless, Litosseliti (2003) summarises a number of shortcomings of focus group interviews outlined by Krueger (1994), Morgan (1998) and Gibbs (1997).

One of these shortcomings is the possibility of bias, manipulation and leading by the moderator; in order to overcome this, the participants in this study were given an opportunity to speak fairly freely during the discussion. The moderator played an active part in clarifying some responses when needed and to encourage more passive participants to speak up when some individuals in the group became domineering. Further, the moderator's assistant took notes of each discussion, which were later compared to the moderator's notes and included into the analysis for the purpose of triangulating the findings.

Another possible shortcoming is the false consensus that sometimes happens when individuals with strong personalities lead the discussion and others, who disagree, do not say so; in order to overcome this, in this research written evaluation forms were introduced. Therefore, each participant had an opportunity to express his or her opinion without feeling threatened about disagreeing with the rest of the group.

Often, owing to the limited number of participants or the difficulty having a real representative sample, it is not always possible to generalise the findings. Generalisation, however, was never the aim of this research. Therefore, this disadvantage was not considered a threat.

3.7.2 Individual Interviews

Similar to a focus group, a one-to-one interview is an interchange of views between two people on a topic of interest (Cohen et al., 2000). Interviews enable the participants to discuss their interpretations of the world and express how they perceive the situation from their point of

view. In this sense, interviews allow the participants (interviewer and interviewee) to construct knowledge (ibid.).

Rationale for the use during the Real World Deployment Stage

Interviews were chosen as a method of data collection in the real-world deployment stage because the researcher was interested in the deep subjective individual experiences of both therapists and children of using the designed application and its possible support of non-directive play therapy principles. Focus group interviews with therapists, therefore, were not suitable, because subjective experience can hardly be arguable, and obtaining this type of information is the aim of focus groups. I wanted to uncover what the therapists thought about the technology and why they thought it, as well as their individual subjective experiences of non-directive therapy while having this technology in their therapy room. Therefore, the interview guide approach (topics are chosen in advance, but the sequence and working of questions is decided during the interview) with semi-structured questions, were preferred because they allowed for individualised in-depth questions.

Despite the appropriateness of the use of face-to-face individual interviews at this stage of the research, it is important to note a number of disadvantages of this method. First of all, the employment of this method may be time-consuming and expensive (Bryman, 2012). Indeed, it took a great deal of time first to reach the research participants - especially those based in Canada - and later to conduct the actual interviews with them. This drawback was also found during the process of transcribing the interviews, which I did myself. Owing to the high cost, only a few interviews were transcribed by a professional; this decision was made in order to fit into the research time frame. The next two disadvantages of an interview are closely related: it can lead to biased and subjective judgements by interviewers and it relies on the skills of the interviewer (Bryman, 2012). In other words, the danger lies in the interviewer's ability to avoid leading questions and misunderstanding of the answers. This is especially challenging for the interviewer, as he has to focus his attention

on both asking questions and understanding the given answers. Recording and transcribing of the interviews gave me an opportunity to check up on the presence of my own judgement in the conversations. Perhaps as a result of having some previous experience in interviewing in a role of an independent researcher for the British Association for Counselling and Psychotherapy, as well as involvement as an interviewer in other research projects, I appeared to follow my interview schedule and keep the interviewees in the lead. Also, to check and ensure my accurate understanding of the responses, I asked: 'My understanding of what you are saying is... Is that what you mean?'

Children's Interviews

Involving children in interviews based on Likert and Non-Verbal Affective Scales has previously been established as a valid and reliable way to obtain their views on their feelings and experiences (Isbister et al., 2006 and Wong & Baker, 1998). Likert - type or frequency scales use fixed choice response formats and are designed to measure attitudes or opinions (McLeod, 2008). As the children in this study were of primary school age and because the children's language ability was lagging behind their emotional and abstract thinking development, questionnaires based on pure verbal responses would not have been suitable. Isbister et al. (2006) describe a number of tested scales that aim to collect children's responses about systems in the human-computer interaction area, especially if the focus is on child feelings and emotions. In other words, these scales generate the data on the children's emotional response to the designed systems.

All the children were asked 'How was it to play with the Magic Land?' The answers were collected through the non-verbal affective scale (adapted from Wong & Baker, 1998; see Figure 13).

Very easy Easy Not easy Difficult Very difficult

Figure 13. Non-Verbal Affective Scale (Adapted from Wong & Baker, 1998).

Another aim of the tests was to understand how engaging the children found Magic Land. The adapted 'little man' movie scale on the San Francisco Chronicle movie review page (Isbister et al., 2006) was used to answer the question 'How good was your play with the Magic Land?' (Figure 14).

Excellent Very good Good Not good Didn't like it

Figure 14. Adapted Likert Scale (see Isbister et al., 2006).

The advantage of these scales is that they provide a visual image of the verbal response (e.g., very easy can be written as a smiley face), which makes it easier for the child to relate to and comprehend what is being asked. In addition, they do not expect a simple 'yes' or 'no' answer but allow for degrees of opinion (McLeod, 2008). The main disadvantage, however, can be seen in the possibility that people may give responses that they believe to be socially desirable, rather than expressing their genuine opinions. In this respect, the children in the present study were reminded that it would be okay to say that the application was 'not fun' or 'not easy to use' as well as it being okay to say that it was 'fun' and 'easy'. It was also explained to them that neither their parents nor I would be upset or angry at any type of response they gave. They were encouraged to say honestly what they thought because it would help 'to

make this play activity better for other children'. Another disadvantage of these scales is that the figures and smiling faces may not be clear enough for all children as they may interpret them in their own way. In order to avoid misinterpretations and to make this process easy and non-threatening for the child, I did not ask children to complete the questionnaires on their own. On the contrary, I was beside the child explaining and sometimes miming the smiles and the clapping from the scales.

Therapists' Interviews at Real World Deployment Stage

The interview questions were developed based on the research aims and questions. As the aim was to investigate individual experiences in depth, each therapist was interviewed three times. The purpose of the first one-hour interview was to find out the therapist's educational background, general attitude and previous experience with technology in their everyday life as well as their therapy practice. The second and third interviews aimed at investigating the therapists' opinions on whether and how the designed application and interactive tabletops could support non-directive play therapy principles. In addition, the therapists were asked to express their views on the suitability of the application on interactive tabletop as a toy in play therapy room.

Validity and Reliability

All the interview questions (with both therapists and children) were pilot tested with another researcher and revised as needed. Direct contact between the researcher (the interviewer) and the interviewee at the point of the interview meant that the data could be checked for accuracy and relevance (Denscombe, 2007). For this purpose I asked follow-up and clarification questions. Further, the fact that the impact of the interviewer and of the context makes it hard to achieve consistency and objectivity (ibid.) was not a concern in the present study, since objectivity and generalisation were never the research aim. On the contrary, uncovering the deep personal subjective individual experiences of both therapists and children was at the core of the investigation.

3.7.3 Evaluation forms/Questionnaires

Evaluation forms were developed in the form of questionnaires. Brown (1988), Cohen et al. (2003), Dix et al. (2004), Preece et al. (1994), and Seliger and Shohamy (1989) refer to questionnaires as data gathering instruments for research, while Esposito (2002) proposes additional attributes by referring to the questionnaire as an evaluation instrument. In educational research, questionnaires are used to collect data on the phenomenon that is not easily observed (e.g., attitudes, motivations, participants' background information) (Seliger & Shohamy, 1989). The main advantages of using this research method is the generation of more open responses and more accurate data owing to the anonymous nature of questionnaires and distribution/collection of the latter at exactly the same time (ibid.)

One of the disadvantages of using questionnaires is that it is difficult and time-consuming to develop. Moreover, it may need to undergo a number of stages of refinement (Wilson & McLean, 1994). In order to make sure that the questions were clear and comprehensive, the questionnaires were piloted with the focus group moderator as well as another researcher. Owing to the small size of the sample and the research aim of gathering rich personal data, the word-based qualitative approach was preferred to quantitative methods (Cohen et al. 2003). In other words, a sequence of semi-structured open-ended questions was used for the respondents to respond/comment on in a way that they thought best (ibid.).

Another disadvantage of questionnaires is that collected data can be limited in sophistication and scope because of the lack of flexibility in response (ibid.). Since questionnaires were used to support face-to-face focus group and individual interviews that would allow sufficiently deep responses to be obtained, the lack of respondent written replies was not an issue in this research. In addition to semi-structured questions that required word-based responses from the therapists, questionnaires

based on the Likert scale (Isbister et al. 2006) and Non-Verbal Affective Scale (Wong & Baker, 1998) were adapted for use with the children in their interviews (described earlier in this section)

3.7.4 Video Observations

As Jones et al. (2012, p.89) puts it, the '...observational method involves watching something, then writing down what happened'. Observation is not a method per se; it is rather a technique that measures the dependent variable and is used to yield qualitative or quantitative data (ibid.). Observations make it possible to gather data on the physical (physical environment), the human (organisation, characteristics and make-up of individuals), the interactional (interactions) and the programme (the resources and organisation) settings (Morrison, 1993, p.80). The purpose of observation is to enable the researcher to see and understand the situation under investigation (Patton, 1990, p. 202).

In this research video-recorded observations were used to determine interface usability problems and to triangulate the data gathered in the interviews in the final real deployment stage. Interface usability tests were conducted through unstructured video observations (parents gave consent for their children to be video-recorded) with the researcher looking for any emerging technical problems as well as evaluating the formulated design requirements. Technical problems were summarised and, together with possible solutions, passed on to the programmer, who worked on integrating these solutions into the application. Based on continuous feedback, the features of the application were constantly iterated to suit the formulated design requirements.

Validity and Ethical Considerations.

One of the biggest disadvantages of the observational method in general is that it is often difficult to obtain permission to carry it out (ibid.). In this research it was especially an issue since I was attempting to

record therapy sessions with a vulnerable young population, which resulted in a lengthy and time-consuming process of obtaining ethical approval (the full ethical approval process is described in section 3.4). Even with the approval granted by Newcastle University, by the children and by their parents, the therapists selected for this study in the UK felt it was not ethical to video record children. Therefore, I had to collaborate with and employ more therapists in Canada (where I was doing the Play Therapy Certificate Programme at the time), who used video recording often in their practice.

Overt observations, where the subjects know that they are being video-recorded, were preferred for the ethical reasons. The disadvantage of the participants being aware of the fact that they are being recorded is the possibility that this knowledge will influence their behaviour (Jewitt, 2012). During the real-life deployment there was already a camera in the playroom used by the therapists for the purpose of improving their practice. Both the therapists and the children were used to being video-recorded; therefore, there was no concern that a camera would make them behave unnaturally.

In order to keep the process of video recording as unobtrusive as possible, I planned to keep therapists in charge of cameras and not appear in the playroom myself. For this purpose therapists were trained in the use of a camera. In addition, they were provided with a video guide to the use of a camera and my contact details. This, however, was found to be counterproductive: the therapists did not handle the camera well which resulted in poor video quality and even the loss of valuable data when the ‘turn on’ button was switched off. Indeed, the difficulty of documenting data is another weakness of video recording (Woodsong et al., 2005). This seemingly easy to use method requires good skills in positioning a camera and ensuring that the therapist and child as well as the screen of the tabletop are clearly in view. Therefore, to resolve this issue I took the step of setting up the camera before the session. Parents gave consent

for me to see their children, and my presence before and after the session did not give rise to any issues.

Observation includes the things that we see, hear and notice, but for it to become more than just the 'evidence of our senses', it has to be systematic, reliable and valid (Jones et al., 2012, p. 89). In other words, the things which one person, in this case the researcher, observes have to be observed and observable by someone else. As explained before, full ethical approval was obtained from Newcastle University and the parents' consent was also obtained. Unfortunately, the analysed videos were not validated. Although the checking of the researcher's interpretations of the video data could ensure better objectivity and validity, the parents did not give their permission for the videos to be viewed by others. Since it was not possible to contact the parents after the data had been collected, in order to protect the children's right to confidentiality it was only I who watched the videos of children referred for play therapy. A full description of the process of analysing the video data is presented in the next section.

3.8 Qualitative Data Analysis

3.8.1 Thematic Analysis

'Thematic analysis is a method for identifying, analysing and reporting patterns (themes) within data', that should be seen as a foundational method for qualitative analysis (Braun & Clarke, 2006, p. 79). It is not only the process of data organisation and description but, even more importantly, the interpretation of various aspects of the topic under investigation (Boyatzis, 1998). There are two main approached to thematic analysis, namely inductive and deductive. Within an inductive approach, which is also called a bottom-up method, themes are identified based on the data themselves. This approach resembles grounded theory in the sense that the researcher approaches the data with an open mind and formulates the emerging themes from the data. In the deductive approach, a top-down method, the researcher approaches the data with

previously identified themes. In other words, the researcher is theoretically driven by specific questions or themes before the data analysis. Therefore, inductive thematic analysis produces overall rich descriptive data, while the deductive approach investigates only the data relevant to previously identified areas of interest (Braun & Clarke, 2006).

One of the major problems with thematic analysis is that although it is widely used, there is hardly any consensus about how exactly to apply it (ibid.). Bryman (2012) even argues that thematic analysis is an identifiable approach and can hardly be found as a separate section in the research methods books. In light of this, it is essential to know how researchers go about their analysis in order to be able to evaluate their research, as well as to make comparisons and synthesis with other studies.

Deductive thematic analysis was employed since the present study was concerned with the system design guidelines (see the formulated design guidelines in Chapter 4) in relation to the following non-directive play therapy principles: *the Development of a Warm and Friendly Relationship; Returning Responsibility to the Child and Letting them Lead; Unconditional Acceptance; the Feeling of Permissiveness to Express Anything; Recognising and Reflecting the Feelings of the Child; Recognising the Gradual Nature of Therapeutic Process; Setting only the Necessary Limits* (see Chapter 1 for a full description). I followed the steps outlined by Braun and Clarke (2006) in the employment of deductive thematic analysis. It is important to note that throughout the analysis I admitted my active role in coding and grouping the codes into the previously outlined themes. Initially it was I who transcribed all the audio-recorded interviews. The transcribed interviews and written evaluative comments, the focus group moderator and researcher assistant's notes were included for the analysis. During step one, I re-read all the transcripts once again to further *familiarise* myself with the data. The next step was *generating initial sub-codes* that relate to each of the theme/code in the predetermined coding scheme (NDPT principles

were chosen as a pre-determined coding framework). Owing to my own personal preference for hand coding and the small sample of participants that resulted in the production of a relatively small amount of data, it was decided to code the data manually using markers of different colours, instead. *Checking sub-codes and their interrelation* within each theme followed this. Having gathered all the data relevant to a particular theme, *all the themes were reviewed* once again to check if they worked in relation to the codes, and vice versa. Once again the sub-codes were refined, paying close attention to specifics within each of the themes. Finally, the writing up of the report served as a final opportunity for analysis.

Before conducting the data analysis, since I was playing an active part in this study, I myself was interviewed by the moderator's assistant to uncover my own perceptions on the topic of investigation. My views were captured through the audio recording, further transcribed and taken into account during the data analysis. In addition, the process of coding was shown to the focus group moderator's assistant, who also checked the codes discovered by myself that formed the identified themes. Following the discussion, the latter were revised (see section 3.8.3 for full details).

3.8.2 The Process of Video Data Interpretation

For the reasons given in the previous subsection, deductive thematic analysis was chosen as the method of data analysis. In order to analyse the video data, I used a pre-determined coding scheme, which I focused on while watching the videos. This scheme was comprised of the eight NDPT principles outlined by Axline (reviewed in the previous subsection). Initially, I planned to use Transana, a software package used to synchronise and analyse digital video or audio data. However, in the process of watching the videos I realised that there was not much talk in the videos, which meant I would not need to use Transana to synchronise the audio and video data. In addition, since I was not interested in quantifying the data there seemed to be no reason to use software for the data analysis. Instead, I made a list, which documented clips that related

to my predetermined coding scheme. Table 4 illustrates a simplified version of the process of the data analysis to give the reader an idea of how it was done. In practice, however, this process was not as straightforward as suggested in the table, but was in fact quite complex, requiring me to go backwards and forwards several times through the outlined steps.

For example, the first code on my scheme was NDPT *Principle 1*: *Develop a Warm and Friendly Relationship with a Child.* I found this theme in videos 2, 5 and 1. I noted a description of what I saw in the videos and also transcribed the few sentences and phrases uttered by the therapist and child that were related to the codes. In video 2 Ted started using the Magic Land before the session actually began. While therapist PT11 was talking to Ted's parents, Ted came to the tabletop and began to explore the software, shouting: 'Look what I can do!' PT 11 had to give attention to Ted, by approaching him and saying, 'Yes, I see'. This example provided data on how the technology aided in the interaction between the child and the therapist, serving as the means by which they started building their relationship. Further, in video 5 I observed Neil saying that he was happy to come to the room because, as he told his friends, he was coming to 'a cool place' where he could play with 'cool toys'. Another child, Rick, who found it hard to talk to the therapist about his feelings because he felt 'as if... being watched by many', started naming his feelings after the therapist drew his attention to the Magic Land instead of their looking into each others' eyes (video 1).

Pre-determined themes/codes	Video numbers	What happened?	What was said?
Theme/Code 1: *Develop a Warm and Friendly Relationship with a Child*	Video 2	Ted using the Magic Land and inviting the therapist before the actual beginning of the session;	Ted: 'Look what I can do!!' PT11: 'Yes, I see' (coming to the child)
	Video 5	Neil telling PT11 that he is happy to be in the room. He told his friends that he was coming to a cool place where he could play with cool toys;	Neil: 'I'm happy to come here' PT11: 'Did you tell anyone where you were going?' Neil: 'Yes' PT11: 'What did you say?' Neil: 'I said I'm going to a cool place where I can play on a cool computer'
	Video 1	Rick is not looking at the therapist, hiding his head and sitting quietly with his hands in his fists. PT11 is asking if Rick saw the new computer in the room. Rick starts using paints and images of fire to show what his anger looks like. He is keeping his gaze on the tabletop and naming his feelings.	PT11: 'How do you feel?' Rick says: 'As if I'm being watched by many [on the stage]'. PT11: 'Have you seen this computer here?' Rick: 'Yeah'

Table 4. Video Data Interpretation: Step 1

Having a description of various situations under each code/theme, I grouped them further into sub-codes (Table 5). For instance, Ted using the Magic Land and inviting PT11 to join him before the session started I interpreted and sub-coded as 'engagement'. Since this engagement was related to the therapist/child interaction, I included it under *Theme 1*: *Develop a Warm and Friendly Relationship with a Child*.

Pre-determined themes/codes	**Video numbers**	**Generated Sub-themes/Sub-codes**	**What was said?**
Theme/Code 1: *Develop a Warm and Friendly Relationship with a Child*	Video 2	Ted using the Magic Land and inviting the therapist before the actual beginning of the session➔***engagement***	Ted: 'Look what I can do!!' PT11: 'Yes, I see' (coming to the child)
	Video 5	Neil telling PT11 that he told his friends that he was coming to a cool place where he could play with cool toys➔***motivation***	PT11: 'Did you tell anyone where you were going?' Neil: 'Yes' PT11: 'What did you say?' Neil: 'I said I'm going to a cool place where I can play on a cool computer'
	Video 1	Rick is not looking at the therapist, hiding his head and sitting quietly with his hands in his fists. PT11 is asking if Rick saw the new computer in the room. Rick starts using paints and images of fire to show what his anger looks like. He is keeping his gaze on the tabletop and naming his feelings➔***motivation*** (later revised and reinterpreted as ***expression of fearful & angry feelings*** under *Theme 4: Feeling of Permissiveness to Express Anything*)	PT11: 'How do you feel?' Rick says: 'As if I'm being watched by many [on the stage]'. PT11: 'Have you seen this computer here?' Rick: 'Yeah'

Table 5: Video Data Interpretation: Step 2

Following the same principle, I used a sub-code for each of the observations within the main theme. Neil's desire to come for therapy (video 5) and Rick's ability to open up when using the tabletop I coded as 'motivation' (video 1). Having outlined sub-codes/sub-themes for the predetermined coding scheme, I checked them for interrelation within each code and re-grouped them. Finally, I refined the sub-codes once again under each of the predetermined themes.

3.8.3 The Process of Revising the Generated Codes

I will now present some examples of how the generated codes were revised by the focus group moderator's assistant.

Having generated the sub-codes by describing what was happening in the videos (Table 5), I showed these written interpretations to another researcher (the focus group moderator's assistant), who double-checked my interpretations. As a result, I moved some sub-codes to different themes. For instance, the video 1 episode when Rick started talking about his anger once therapist PT11 had drawn his attention to the Magic Land, I initially interpreted as 'motivation' to speak and open up. In the discussion with the researcher who I asked to check this code we agreed that it needed to be more specific. This resulted in relabeling 'motivation' as 'expression of fearful feelings', which no longer came under *Theme 1*, but was instead moved to *Theme 4: Establishing a Feeling of Permissiveness to Express Anything*. Nevertheless, we agreed that there was another sub-theme in this episode that related to *Theme 1*: 'dependent on therapist's skills'. Indeed, it was therapist PT11 who suggested that Rick focused on and used the Magic Land if he wanted to talk about 'whatever he wanted to talk [about]'. Therefore, following the revision, this episode from video 1 was used to generate two sub-codes in relation to two predetermined codes/themes: *Theme1 & Theme 4*.

Another example of the revised sub-codes could be found during the interview data analysis. For example, during the interview therapist PT11 said: 'Yeah it's great. It's a motivator, you know, they like to come back, 'oh

great, can I play on that machine'. They have to come back or they want to come back. Erm they are, you know, it's kind of an ownership for them as well because it's part of the team, you know, they shut it down, you know and they kind of control that part [okay] or they have control over it...erm year and it's kind of a reward for them really but I find it erm less pressure and it's for them because they don't need to complete a task or anything, it's just there and they can leave it and it's not upset and they come back and it's awesome, it's right there available and I can start over again.'

The therapist's feedback provided quite a lot of information in a single paragraph. Initially I broke it down into parts and coded it in the following way:

'Yeah it's great. It's a motivator, you know, they like to come back, 'oh great, can I play on that machine'. They have to come back or they want to come back' ➔ **motivation & engagement (*Theme 1*);**

'...they shut it down, you know and they kind of control that part [okay] or they have control over it...erm year and it's kind of a reward for them really but I find it erm less pressure and it's for them because they don't need to complete a task or anything, it's just their and they can leave it and it's not upset and they come back and it's awesome, it's right there available and I can start over again' ➔**staying in control (Themes 2/3).**

Following the discussion with the focus group moderator's assistant, I realised that 'staying in control' referred mainly to the first sentence and that the above paragraph contained more than one sub-theme; therefore it needed additional coding:

'...I find it erm less pressure and it's for them because they don't need to complete a task or anything, it's just their and they can leave it and it's not upset and they come back and it's awesome, it's right there available and I can start over again' ➔ **taking pressure off (Theme 6).**

These are just some examples of how the codes were altered after the revision. Owing to limitations of space and the word limit on this thesis, it is obviously not possible to present all the revised cases. These few illustrations are presented in this subsection to give the reader an opportunity to see the process involved in generating and revising the codes.

3.9 Summary

In summary, in this chapter I have discussed the research aims, research questions and the study design. I have outlined the theoretical framework for this research, which was based on the NDPT principles and child development theories. I have discussed in detail such research methods as focus group and individual interviews, questionnaires and video observations. I engaged in self-reflection and scrutinised how my educational background and beliefs about the application of tabletops in therapy influenced the way this study was carried out. I provided the participants' background information and presented the steps and strategies that were employed to ensure the reliability and validity of the data obtained, as well as the ethical conduct of the research processes. Finally, I discussed why and how deductive thematic analysis was utilised as the data analysis method.

CHAPTER 4. DESIGN PROCESS AND FINDINGS

'Design is the method of putting form and content together. Design, just as art, has multiple definitions; there is no single definition. Design can be art. Design can be aesthetics. Design is so simple, that's why it is so complicated'

~ Paul Rand

4.1 Introduction

This chapter describes the design processes and presents the findings in relation to the research questions. In Part 1 the design process is described. First, a development research approach used in the field of Human-Computer Interaction was adopted to form the design guidelines. Then, by applying an iterative design (a process of software evaluation used in a developmental research approach), a number of initial prototypes were evaluated and a final version of the application was developed. In this part, the first research question is answered. In Part 2 the findings in relation to research question 2 are presented. The focus of this part is on demonstrating how the designed technology can support non-directive play therapy principles, which were taken as the theoretical framework for analysing the audio and video data.

4.2 Part 1. Design, iterative cycles and development of a final prototype

4.2.1 Formulation of Design Requirements

This section presents the findings in relation to the research question below:

Research question 1: 'How, if at all, could an application on an interactive tabletop be designed to suit a non-directive play therapy framework?'

The findings relating to this research question are drawn from the literature as well as the data obtained from the interviews with the play therapists. Since this study is among the first that has attempted to design an application for non-directive play therapy, there were hardly

any previous research studies or guidelines that could be used to guide the design process used in the current research. In light of the lack of any instructions, the theoretical principles of non-directive play therapy were used as the guidelines for designing the application.

As shown in the literature review in Chapter 1, non-directive play therapy emphasises the importance of the child/therapist relationship in bringing about therapeutic change. Principles such as *Development of a Warm and Friendly Relationship, Unconditional Acceptance, Freedom to Express Anything* etc. are the core of non-directive play therapy (Axline, 1947) and are related to child development theories. Naturally, the question of how technology fits into these complex abstract notions of human relationships arises.

It was never the aim of this research to design a system that replaces the therapist. Therefore, I wondered if and how the design of the system could support therapists' work through supporting non-directive play therapy principles. It seemed that in order for the system to be able to support these principles, they would have to be reflected and embedded in the whole system design. While it is quite straightforward to implement some of the principles, others present much more of a challenge. For example, the principle of *Letting the Child Lead* could be implemented by designing the system to be non-prompting and passive unless the child initiated the action. *Unconditional acceptance*, on the other hand, is a hard principle to design for, and needs much more thinking and creativity. One thing seemed to be definite, though: if the system were to support non-directive play therapy, it would have to be aligned with the non-directive play therapy principles outlined by Axline (1947).

Based on the theory behind current practice (see Chapter 1) and on an understanding of what the therapists interviewed in this research thought about using technology in a therapeutic context, the following

were outlined as a set of design requirements for digital toys appropriate for non-directive play therapy:

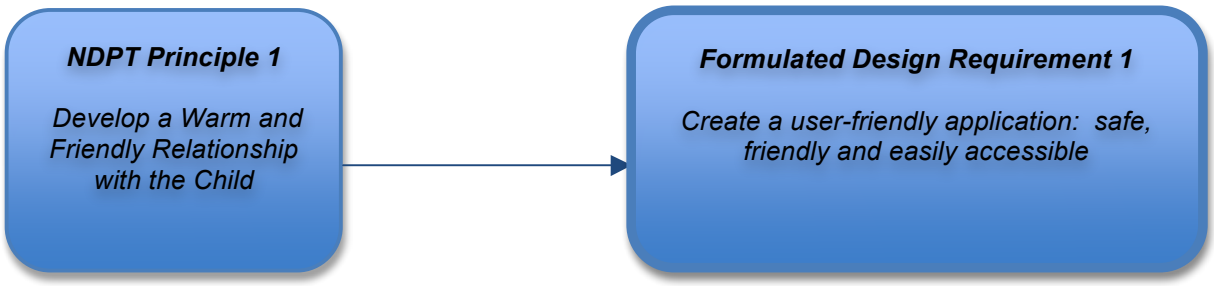

Figure 15. Formulated Design Requirement 1

The first principle of non-directive play therapy, upon which this design requirement was based, is that the therapist has to *Develop a Warm and Friendly Relationship, a* part of social interaction with the child. To support this principle and allow for relationship building, the therapists emphasised the need for any activity with a digital toy to be visible and accessible by both the child and the therapist. This has an implication for the choice of the hardware itself, as the latter should be big enough to allow both the child and the therapist to access it to an equal extent without either feeling excluded. In other words, small tablets and DS devices may not be appropriate since they are not easily accessible by two people at the same time. Only when both the therapist and the child have equal access to and full visibility of the computer screen can it help to support the building of a relationship and make the application user-friendly to both the people who are using it. The equality that underlies a symmetrical relationship is especially important and is 'at the heart of non-directive theory and practice' (Wilson & Ryan, 2005, p.75). Erikson (1964) states that this equality is based on the inherently equal worth of both children and adults, despite the obvious inequality between them owing to children's immaturity.

Additionally, the therapists recommended that digital content evocative of frightening places should be avoided in order for the child to

develop trust. The importance of trust is also reflected in Erikson's emotional theory of child development, which identifies 'trust versus mistrust' as the first of five stages in the lifecycle from infancy through adolescence (Erikson, 1964). Further, Bowlby's theory of emotional development proposes a theoretical explanation for the importance of continuous child-parent relationships. Reliable parental care for the child's needs results in a secure attachment (Bowlby, 1969). If a parent is absent, and the care is inconsistent, the child loses trust in the significant carer, which may result in the formation of an insecure attachment. Since children in therapy may suffer from attachment issues, the re-establishment of basic trust is the fundamental issue in therapy (Wilson & Ryan, 2005). Therefore, to support the building of the relationship and the re-establishment of basic trust, a computerised toy may need to be friendly, warm and trust promoting.

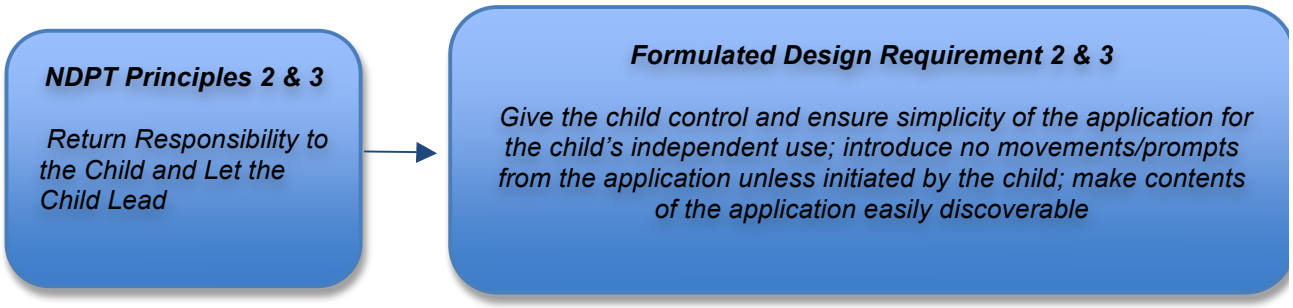

Figure 16. Formulated Design Requirements 2 & 3

These two design requirements were developed to support the non-directive play therapy principles of *Returning Responsibility to the Child* and *Letting the Child Lead*. The therapists emphasised the fact that a digital toy should place the control of play in the hands of the children, empowering them to become more trusting of themselves: '*the more control the child has the more willing they are… to trust themselves and the effect is to bring out all the power within them'* (PT4). Mastery through play is considered important within the therapeutic environment (Sallman, 2007) and contributes to the development of the child's sense of power,

control and mastery of the environment. This is particularly important for children who live chaotic or disrupted lives (Landreth, 2002). Moreover, to let the child lead and enable his or her sense of mastery the application has to be easy for the child to use independently. Also, the contents of the application should be simple and easily discoverable so that the child is not put in the position of asking the therapist for help and instructions (as required by NDPT principles).

Digital toys in a non-directive therapy context should give the child freedom to choose what and how to play. Free play is essential for children's emotional and social development, especially during their second and third years when a child's will is developed (Erikson, 1964). Negative feelings can predominate if a child is not given the freedom to make enough age-appropriate decisions. Therefore, to create opportunities for decision-making, nothing should be imposed on the child, as the child should remain in full control of what to express and how to express it within the application. No prompts or movements should be initiated by the system. Further, freedom and choice allow the child to develop a sense of direction. This requires a digital toy to be non-structured and affords children the opportunity to create their own scenes and characters: '*non-directive, where the child is allowed to produce whatever, within what the application can provide…*' (PT4). In addition, Hancock et al. (2010) suggest allowing children to create their own toys in order to give them even more control over their symbolic play. Indeed, this is an area where digital toys have a unique potential.

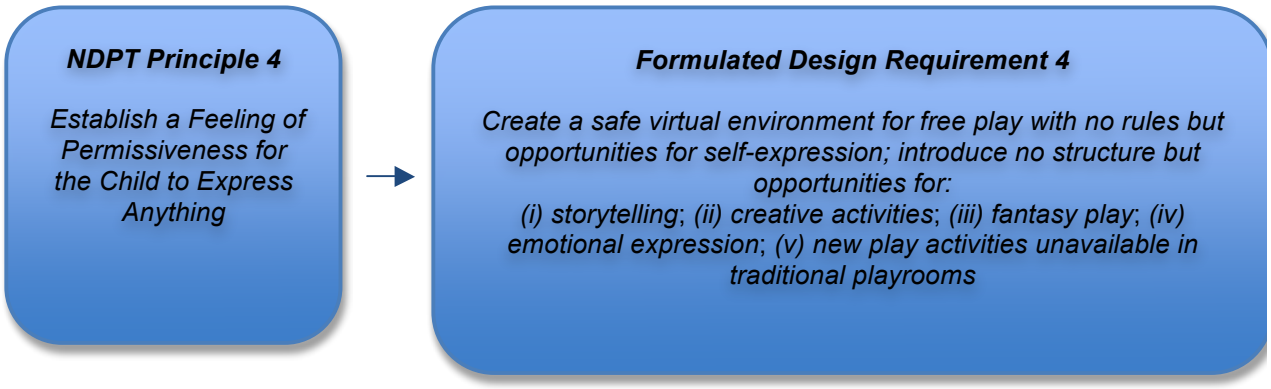

Figure 17. Formulated Design Requirement 4

This design requirement originated from the play therapy principle of *Establishing a Feeling of Permissiveness for the Child to Express Anything*. Flexible play is emphasised in non-directive play therapy. When therapists create a permissive environment and follow the children's lead, the children are in the position of exercising their will to establish and change rules as they please. This type of play is seen as 'a self-regulating activity with the biological function of assimilating personal events freely, largely without constraints imposed by the environment' (Wilson & Ryan, 2005, p.51). When a permissive therapeutic environment is established, play acts as a means of mastery, learning and the processing of difficult feelings and events. While healthy children have play opportunities occurring spontaneously in everyday life, emotionally troubled children may not have such opportunities in their lives. In the permissive environment that is created therapeutically, they can therefore work through their rigid or dissociated schemas with the therapist's support (Wilson & Ryan, 2005) and move towards the feelings of autonomy, initiative and industry that are necessary for a healthy development (Erikson, 1968).

To support the therapist in establishing a permissive environment, it is necessary for any digital toy to provide a safe, flexible means of free play with no rules, and ample opportunities for self-expression. Since the technology is not limitless in its possibilities, the therapists emphasised

the types of play in which they thought an interactive tabletop would have the most potential to support the child's self-expression: storytelling, creativity, fantasy play, emotional expression and new play possibilities that are not usually available for children with traditional toys.

It was proposed that ***Storytelling*** should be done with virtual farm and family sets. To enable this type of play, the therapists suggested that pictures of animals and family characters as well as some images of objects that could be used to create farms (e.g., a fence) be made available for the children to create their stories: *'a farm set for example; there's a farm set with some animals and a fence and you could have an application for that where the children could create their own families and separate them and have homes and have animals attacking and play that and it's their process...' (P4)*; *'Yeah, and then they [children] might have pictures on the tabletop of the environments and figures that would interact with that' (PT7).*

Interactive technology was thought to be especially suitable for helping children to create their own worlds and share cultural stories, since it can provide such a wide variety of pictures. The challenges of cultural issues in relation to toys in play therapy are discussed in Gill and Drewers (2005, p.20), who state that cross-cultural play therapists pay attention to toys that are typical of other cultures and 'recognize the distinctive meanings' attached to toys in different cultures. For example, in Japan, the snake is not a frightening creature but a symbol of wisdom. The owl, a symbol of wisdom in European culture, is viewed as a sign of death and dying among Native Americans. The same toys may have different meanings for children from different backgrounds. Not only can the same animals, for instance, have different symbolic meanings, but also the absence or different appearance of buildings, nature and people can be challenging for the cross-cultural play therapist.

Gill and Drewers (2005) further recommend that play therapy offices should therefore contain as many visual representations of cultural diversity as possible. Since the number of images on an interactive tabletop can be almost unlimited, the therapists who took part in this research thought that this possibility could help children create more personalised and culturally accurate stories. For example, a refugee child from Iraq could select pictures of his own country and re-create the place where he lived by choosing the most suitable scenery and images of people:

'I think the bigger thing I'm thinking about is using it to create worlds which children could explore - particularly worlds similar to the things they have in their own lives, and, particularly, children from different cultures: a child from a travelling family wanting to recreate their experience of what it's like to live in a caravan, for example, and then there's a caravan' (PT7).

Another application of storytelling is related to fantasy play (for a full description of fantasy play, see page...). The therapists thought that because the technology is *'great visually' (PT2)* it would enhance storytelling through the creation of imagined worlds and galaxies: *'… the facilities sound wonderful… and for a boy it could be all sorts of things inside the submarine, inside a spaceship where these people are living' (PT4)*. They emphasised the fact that, unlike having a static doll's house, an ability to create their own environments and move things around can be *'very empowering' (PT5)* for children.

Creativity was another type of play that the therapists thought an application on an interactive tabletop could be designed to encourage. Since the technology makes it possible to create visually beautiful images, the therapists suggested having sparkling and moving things in the application that children could use to create and then go on to play with: for example, a piece of sparkly cloth that could be re-shaped and decorated: *'All sparkly cloth - if there was something where you could sort*

of take scraps, 'cos they sort of like to stick things onto paper, don't they? (PT5). They also suggested making it possible for the child to create a collage using flying feathers, glitter, tree leaves and other creative materials such as creative shapes and pieces of sparkling cloth: *'… sort of collage and if you could build in all of that: feathers, glitter...' (PT5)*. The therapists thought one of the benefits of having virtual creative play was that it would not cause any mess and that no tidying up would be needed, and so it would help to overcome problems associated with limitations of time and space: *'I could see an application where you could use glue and paint and glitter without making a mess ready for the next child, perhaps, in a room where they weren't allowed to make a mess' (PT1).*

Painting and drawing with fingers was suggested to encourage the child's creativity further: *'a drawing and painting tool certainly you could use...' (PT5)*. Unlike drawing with traditional pencils, interactive tabletops enable direct interaction with the computer screen that becomes the equivalent of a piece of paper on which the child can create just by touch. Indeed, as Wilson and Ryan (2005) state, the effectiveness of non-directive play therapy depends on whether 'play offers a stimulating environment for both intellectual and emotional creativity' (Newson & Newson 1979, p.12). Since their mental and language abilities are not fully developed, children represent their inner experiences by means of symbolic tools that become their language during creative activities: 'Just as language makes subtle and complicated thought possible, perhaps toys do the same for play' (Newson & Newson, 1979, p.12). The important role of creative and symbolic types of play in a child's healthy development was also established a long time ago by Piaget (1952) who considered them the basis of the processes of assimilation and accommodation.

In addition to creative play, ***Fantasy Play*** was outlined as a possible mode of self-expression on an interactive tabletop. Fantasy can be defined as a 'metaphoric place where problems of the past and

present meet the possibilities of the future, in conflicts both minor and epic' (Rubin, 2007, p.3). It can be described as a place of escape, in which one can make sense of the real world by creating and telling one's own stories. According to Piaget's theory of child development, fantasy play as a form of internal representation and symbolism helps a child assimilate real-world experiences, which results in the development of a sense of understanding and mastery (Piper & Hollan, 2008). Fantasy is also a way of distancing oneself from painful events (Landreth, 2002), of constructing and finding meaning, expressing emotion and exploring identity (Rubin et al., 1978). Fantasy and imaginative play also provide the child with a means of reducing tension that is associated with conflict resolution (Rubin, 2007).

Children use superheroes and avatars to (i) work through feelings of strength and weaknesses, (ii) compare their and their families' qualities to those of superheroes and (iii) clarify self in relation to community values (Porter, 2007). In other words, play with superheroes supports the exploration of personal, family and cultural values as well as adding to the development of an internal sense of self and self-regulation in a social context (ibid.) In addition, opportunities for fantasy and imaginative play through superheroes should permit the child to 'detach' and work things out in a safe environment: for example, '*The representations could be scared or brave for them so they can detach, but just giving them that opportunity to be apart from it… it's a fantasy'* (PT4).

The virtual use of superheroes may and probably will reduce the sensory experience of play: *'I guess what it loses is that, what's the word – tangible. It loses that feeling, that moving around that a child can do, but if they can do it in their imagination and they're prepared for that, with the child like that you wouldn't lose anything, but some children are not naturally expressive and sitting still for 20 minutes is quite a hard task...' (PT4).* Sensory experience is essential for the therapeutic progress of sexually abused children in particular: *'... the actual job of the therapist is to help that child through those traumatic memories in a safe way' (PT7).*

Nevertheless, virtual fantasy play can enhance tangible play by providing a diversity of options and the flexibility to adjust these options to each child's individual needs and desires. Further, virtual play could be seen as limiting only if it were to replace traditional toys. If, however, virtual play is used to supplement traditional fantasy play, this would only enhance the latter by providing the child with more choices from which to pick the type of play that is most appealing to him or her: *'… well, there's no reason why, unless it is a very small room - you couldn't have both' (PT3). 'It wouldn't be excluding, it would be just offering another choice' (PT4).*

Another design requirement identified for the application was the creation of opportunities for ***Emotional Expression***. Although the therapists requested the development of an application that enables self-expression, they had quite a few different ideas on how exactly to design for emotional expression. The first idea necessitates the use of images of people, tree trunks or jelly baby trees and characters in different positions expressing various emotions, so these would have to be made available in the application. Since the technology allows for an unlimited diversity of images and the possibility of changing any of these images, the therapists thought it could be used to enhance the children's expression of feelings through the virtual toys that they are using.

For example, a traditional doll can usually have just one facial expression, which may not be exactly what the child is looking for. With a virtual doll, children could have more options of facial expressions to put on the doll, as well as to change them as they play along: *'You could have kind of feelings applications with those pictures of how you're feeling, how you see something in the playground, like having or not a lot of friends, how you're feeling in the classroom, like quiet or happy or... and that could [be used to] assess [children] in a certain way… where they don't have to be intimidated by the words' (PT6)*.

Although the therapists agreed on the potential benefits of this option, they seemed to struggle to make practical suggestions as to how children could actually change characters' facial expressions. They suggested looking at the Poser programme that makes it possible to move characters' faces, *'making the smile bigger or making the eyes look more sad' (PT7).* The general opinion was that children be provided with a number of ready-made images of various emotional expressions that they could choose from: *'... just a range of pictures on the screen and they could choose (PT5)... shy, scared, bored (PT3)... all the expressions (PT6)... achieving, proud... (PT3)... hiding (PT4)... frustrated, crying (PT6)... ecstatic (PT1)*.

Some of the therapists, however, noticed that even with a diversity of images of emotional expression available, the child would still put his or her own interpretation on it, possibly different from the one the designer intended. In other words, no matter how many pictures of emotions you provide children with, it will still be up to them to decide what it is they are seeing: a sad face can be interpreted both as sad and as tired: *'so for us the judgements of what that picture means to us might be very different from what a child would think' (PT5)*.

Therefore, although the technology could enhance the possibilities of emotional expression through enabling the child to put facial expressions on virtual toys, the therapist may need to be careful not to make assumptions concerning what these facial expressions chosen by the child mean. In addition, it was suggested that even if no interpretations are made by either the child or the therapist, the child can benefit simply from the process of creating an emotional expression for a virtual character: *'I think it might have significance...it can be just like 'I've created that picture!''(PT4).*

Although the majority of the therapists agreed on the benefits of expressing emotions by means of the virtual application, there was also a single but strongly expressed opinion that using virtual toys for emotional

expression may not be cathartic. It was suggested that for the therapeutic change to occur, the child has to express the emotions bodily rather than simply processing them visually. However, to agree with such a point of view would be to deny the possibility of achieving emotional self-expression by means of both (i) virtual toys AND (ii) on the bodily level.

A 'feeling application' as a form of assessment was another suggestion as to how systems could be designed to support emotional expression. Images of characters in different moods could be used with a child to assess his or her emotional state in a creative way: *'you could have kind of feelings applications with those pictures of how you're feeling, how you see something in the playground, like having or not a lot of friends, how you're feeling in the classroom, like quiet or happy... and that could [be used to] assess... they don't have to be intimidated by the words' (PT2)*.

This application could be used to supplement the existing formal Strengths and Difficulties Questionnaire (SDQ) that is being used in the current practice with parents and teachers. The feeling application, being based on pictures rather than words, could enable children to do self-assessments in a way that is more appropriate for their age: *'a really creative form of assessment' (PT1)*. Most of the therapists thought that it would be a good idea to use the feeling application for assessment purposes; however, there was a strongly expressed minority view that the opposite would be the case. According to this latter position, non-directive play therapy is opposed *to* the idea of assessment in general and, therefore, it is hard to see the how the technology could be suitable for carrying out even a creative form of assessment: *'I wouldn't want to use [it] because it wouldn't be me, but the non-directive creative part is what I do' (PT4)*.

New Play Opportunities. Activities which are not available in play therapy with other toys (e.g., play with fireballs) were seen as being

potentially advantageous and as having the capability of enhancing the child's creative and fantasy play: *'they [children] can do anything [on the tabletop] and they can do anything - it's just limited by the child's imagination, so I mean you could have them doing flying and lightening, thunder' (PT5)*.

In addition, therapists found resizing/rotating images by hand to be interesting and potentially beneficial for the therapeutic process. They thought such opportunities may enable children to express their feelings in a new, creative and imaginative way. In addition, resizing can help children express something about themselves through the size of the image. For example, making themselves very small and their father very big may indicate how they feel in the presence of their father. Therefore, resizing can provide the child with opportunities for a new mode of expression, and the therapist with a deeper insight into the child's inner experiences: *'… it gives the opportunity to the child to use size to express something about the person so that they could say that their dad is a big ogre... and themselves very small. The baby might be very big and it could be a big baby in that sense and it is really open for their imagination and their feelings. And it's a concrete way of doing this without saying any words because they don't have the words, and as long as they're playing it out, as long as it's not them, they can divorce from that. I feel really comfortable with it (PT4).*

It may be noticed that the design requirement of providing new play opportunities is closely linked to the rest of the modes of self-expression (storytelling, fantasy play etc.). Although all these types of play that aim to support self-expression are presented here as separate categories, there are hardly any clear boundaries between them in practice. In a similar way to traditional toy categories, play types on an interactive tabletop can overlap. For example, all the types of play described above could be observed in the play of a child who tells a fantasy story by creating a spaceship with farm animals on it (storytelling and fantasy play) and gives the animals facial expressions (emotional expression). Further, adding fireballs and water drops to this creation

would bring in creative play. It can actually be argued that creativity can be found in any of these play types: storytelling, fantasy play, emotional expression or new play opportunities. This would largely depend on the child's intentions and the purpose of play. The reason for mapping out play types that support self-expression on an interactive tabletop separately was to establish a starting point for understanding the purpose of virtual play in play therapy. Although the child would mix and combine these types of play in practice, it was still important to outline areas of possible self-expression in order to guide and track the design and evaluation processes of the application.

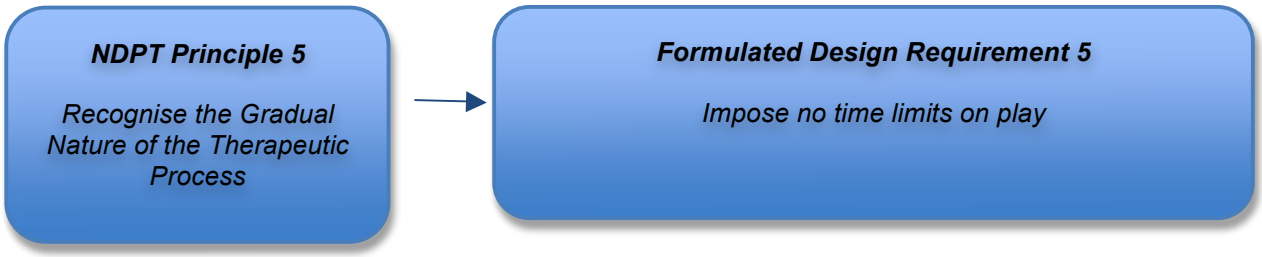

Figure 18. Formulated Design Requirement 5

This design requirement is based mainly on the theory of non-directive play therapy. One of the principles of the non-directive approach is to *Recognise the Gradual Nature of the Therapeutic Process*, which means the child must not be hurried at any time. This principle is derived from the humanistic counselling developed by Carl Rogers, who believed that each person has the potential for growth and self-actualisation. The counsellor, therefore, should follow the client's lead, allowing time for the maturation and growth of Self (see Chapter 2 for a full description). The majority of existing computer games are designed around the concept of 'time to complete'. In other words, the designers often assign time limits for the achievement of a goal. This design approach, however, is diametrically opposed to the humanistic theory of counselling (Rogers, 1951; Axline, 1947) and therefore is not suitable for the therapeutic

context of non-directive play therapy. The design requirement of no time limit was therefore formulated.

Figure 19. Formulated Design Requirement 6

The next principle of non-directive play therapy is that the child has to be accepted by the therapist unconditionally, just as he or she is. In light of this, it can be argued that a digital toy should support the unconditional acceptance of the child's Self. In other words, if play is goal-oriented and the child loses, she may feel frustrated and disappointed in herself. This can increase feelings of guilt and embarrassment, which many children referred for therapy experience. These feelings may be caused by inconsistent and restraining care, failing to protect children from experiences that are beyond their ability to understand or deal with at their age, and as a result causing overwhelming shame, doubt and a feeling of self-worthlessness (Erikson, 1968). Since children in therapy often have the 'will to be oneself' (Wilson & Ryan, 2005, p.71) and to be free from unreasonable expectations set by carers or other significant adults in their lives, digital play in a therapeutic context should be free from goals, tasks and levels of difficulty.

Also, digital toys should promote play activity that is simple enough for the child to master whilst also being sophisticated enough to support a child's self-expression. At the same time the toy has to be flexible and allow for a variety of possibilities, character behaviours and

play outcomes. Facilitated play should not be about winners or losers but should encourage the expression of a range of feelings and behaviours. According to the therapists in this research and the literature (Landreth, 2002), safety is a crucial factor in allowing children to be able both to express themselves and to explore.

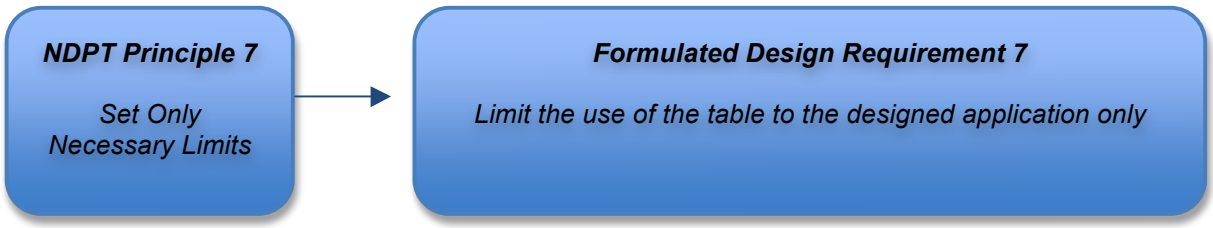

Figure 20. Formulated Design Requirement 7

Since the application would be available on an interactive tabletop, all the features of the computer (e.g., Internet, Documents) would also be available for the user. If the child knows how to exit the application and access the main screen of the computer, it opens up the possibility of the child using the computer for purposes other than just the designed play activities. This, in turn, could easily expose children to situations that are beyond their ability to deal with at their age and provoke the sense of guilt and embarrassment outlined by Erikson (1964) and discussed earlier. Alternatively, the child may engage with the Internet, mastering it well, which may negate the therapeutic process, as the Internet is not amongst the toys to be used within the non-directive play therapy context. Therefore, it was decided to limit children's use of the table to the designed application by not telling them how to access the main screen. This design requirement reflects the non-directive principle of *Setting Only Those Limits that are Necessary* to keep the child emotionally and physically safe.

Figure 21. Formulated Design Requirement 8

To support the principle of *Reflecting the Child's Feelings*, saving and printing options should be made available for the child and therapist. According to the therapists' feedback, saving the child's work could be beneficial, especially for novice play therapists in training or supervision: *'... a bit like IPR – Interpersonal Process Recall'... training for hours where you get someone showing you what the child was doing and asks you what you were thinking etc. (PT4)*.

Initially, some therapists speculated that the recording and replaying of the child's work on an interactive tabletop should be included in this design requirement: *'I thought when you first mentioned it that it would be a benefit, because sometimes you do miss things and when you come to reflect next week after missing them for a week it would help you think 'oh well, I missed that...' (PT2).*

Other therapists, however, argued that what children are making is not as important as how they are making it. In other words, watching a replay of a child's play on the tabletop would not be particularly helpful unless the child and his or her bodily and emotional reactions could be observed. Even then it may not be particularly beneficial to have such a video, as non-directive play therapy is about connecting to the child emotionally during the session, rather than making judgements on the child's play afterwards: *'My gut feeling about it is that for non-directive play therapists [watching a replay would] probably not [add] a lot, but for an analytical play therapist or behavioural play therapists or someone like that it might have a lot of application' (PT4)*. In light of this disagreement

regarding the usefulness of ‘record/replay’ options, it was decided to not proceed with them and to include only ‘save’ and ‘print’ options at this stage of research.

4.3 Implementation of Design Requirements: First Prototype

Based on the design requirements described in the previous subsection, the first paper prototype of the application was developed. This subsection presents the first paper prototype and describes how the outlined design requirements guided the design process. Each number in brackets corresponds to the number of the design requirement outlined in the previous subsection. At this stage the programmer was not involved, as I needed the therapists’ feedback on the paper prototype first before starting its digital implementation.

In order to support fantasy play (*4-iii*), the first prototype was designed as a Magic Castle where the child could engage in free play (*4*) within the options provided.

*** Figure 22. Paper prototype of Magic Castle**

*The pictures are copyright and were used in the paper prototype of Magic Castle for illustration purposes only.

To support the design requirement that the application be user-friendly (*1*), the castle was planned to be facing the child, and to appear inviting and welcoming. Play in the castle would have no time limits (*5*)

but would be available for the child at any time. The castle would, however, fade in for about 15-30 seconds to indicate the beginning of a play therapy session and then fade out gradually at the end, in order to prepare the child for the end of the session. The idea of a castle was chosen as an extended representation of a doll's house to provide opportunities for storytelling (*4-i*). While exploring its magic rooms, the child could explore and express his/her inner world, as the magic rooms would be specially equipped with virtual tools/toys to become the child's language. Those tools and toys would be in the child's power and control (*2*) to enable him to express his experiences and feelings by creating imaginative environments (*4*) and to express himself in play that was free from rules and time limits (*5,6*).

To create a safe environment (*4*), a 'secret word' could be used to enter the castle and unlock the application. To protect the child's confidentiality (*1, 8*) the castle would be accessible by the child alone and nobody else could enter it, unless the child wanted to invite the therapist to play with him or her. Typing in a magic/secret word on the gate would give the child control (*2*) and enable her to enter the castle. A new screen would come up with the interior of the castle similar to the picture below, but in a more 'fantasy style' (*4-iii*), with stairs leading to various locked rooms that the child could explore. Children would be given no instructions about how to exit the Magic Castle, in order to limit the use of the computer to the designed application only (*7*).

Figure 23. The interior of the Magic Castle

The rooms would be based on the types of play outlined by the therapists. In order to support storytelling (*4-i*), the first room could become a virtual Doll's House for the child to explore real-life events with enhanced possibilities for creative play (*4-ii*) and emotional expression (*4-iv*). The main options available for the child in this room would be colouring and drawing as well as the resizing and rotating of images of various characters, farm animals and furniture. To give the child control over what to keep in the room and what not to keep (*2*), opportunities to make images vanish from the screen by means of a hand movement could be provided. To enable emotional expression (*4-iv*), the child would be able to change the emotions of the characters by manipulating their eyes, lips etc.

In order to implement a feeling application to enable the child's emotional self-assessment (*4-iv*), the Rosebush room could be made available. The idea for creating this room was adapted from a focused intervention called 'Rosebush'. The child could be presented with a landscape and a rosebush. He/she could modify the way the rosebush looks, the place it is planted in etc. This room would allow the child to express feelings and give the therapist and the child a glimpse of the child's inner world, especially in the first assessment session.

To enable emotional expression further (*4-iv*), the second room, Battlefield, could encourage children to release anger and aggression by engaging in free unstructured play (*6*) that allows them to demolish things and environments. New play opportunities (e.g., virtual mud, water) would be available for children to express their feelings in a new, creative and imaginative way (*4-ii/iii/v*). Darker images would also be available if they wanted to use them to express their fears (*4-iv*).

In addition, to encourage new play opportunities (*4-v*) as well as to encourage fantasy play (*4-iii*), a Water and Sand room could be introduced. In this room the child would be able to play with virtual water and to play with sand by manipulating it. To explore control issues (*2/3*),

some parts of the sand could be moved quickly, slowly or not moved at all. A number of images on a sea theme (shells, stones, fish etc.) would also be available (*4*).

The Flying Feathers room could provide opportunities for children to express their creativity (*4-ii*) by engaging in making a creative collage using stars, feathers, colour shapes, clouds, leaves and a paint pallet, and to make of it anything they desire (*4*). The children would be in full control (*2/3*) of options such as resizing, changing colours, erasing, going one step back, and saving and printing their creations (*8*).

4.4 Second iterative cycle: Improvements to the 1st prototype

The second prototype was developed on the basis of the therapists' feedback on the first prototype. In this subsection the emergence of the second prototype is described. I also present the rationale behind the choices that were made for improving the first prototype.

Design requirement 1: Create a user-friendly application

The therapists' responses suggested that improvements could be made regarding the implementation of this design requirement. Some of the images and pictures in Magic Castle were thought to be too dark and frightening. It was suggested that in order to make the application *user-friendlier* and at the same time help to develop the therapist/child relationship, the pictures should be replaced with more welcoming, warm and even 'healing' images (PT6). Children should feel that they are entering a safe space where nothing can hurt them: *'... children who had some difficult experiences might need to feel they are entering something that is safe...and they would feel somehow held...[the application] needs to feel welcoming and reasonably comfortable for most children' (PT1)*.

In addition, during the second iterative cycle the name of the application was changed from Magic Castle to Magic Land. This was because the therapists thought that the idea of a castle and the rooms

within it could be too realistic and frightening for a child and could become a barrier in therapy: *'It looked a bit cold, dark and scary and perhaps if I were a child I would have had a bad experience and it could be a little bit of a barrier' (PT5)*. While children are familiar with traditional toys and have formulated expectations of what toys look like and what they can and cannot do, the virtual castle is unfamiliar and may look risky and dangerous to the child, especially owing to the realistic pictures of rooms and stairs.

Design requirements 2 and 3: Give the child control and ensure simplicity of the application for the child's independent use; introduce no movements/prompts from the application unless initiated by the child; make contents of the application easily discoverable

It appeared that these design requirements were implemented quite successfully in the first prototype: *'I like the child having the power and control' (PT1); '[Being in control] seems to be very empowering... ' (PT5)*. It was emphasised that the more control children have the more trusting they can become of themselves to bring out the power within: *'... because the more control children have the more willing they are... '(PT4) '… to go further' (PT6), '...to do it. We're asking them to trust themselves, and the effect is to bring out all the power within them' (PT4)*.

The only criticism concerned the fading in and out of the application at the beginning and the end of the session. Although this feature was introduced to help children prepare for the beginning and ending of their play on an interactive tabletop, it was considered to be opposed to the non-directive play therapy principle of returning responsibility back to the child. In other words, it should be the children's choice when and how to finish their play. If they struggle with ending their session, the therapist is there to 'hold' their feelings but not to make choices for them: *'It's their choice so they need to be in control of that ending rather than having something really structured like that... I don't think it's a benefit really 'cos that's an issue the therapist has to deal with*

rather than something that you can deal with through an activity... and I'd be worried that therapists would think they needed to help children leave the therapy session smoothly...' (PT7). Thus, in order to give the child full control over what is happening within the application, the fading in/out option was not included in the second prototype.

Another aspect that was strongly emphasised by the therapists was the importance of the application being easy and simple to use without having to rely on the therapist's instructions, because within non-directive play therapy the therapist should not direct the children or their play in any way:
'… they [children] should be able to figure it out anyway, just like you figure it out with [traditional] materials in the playroom and children pick them up and don't know what to do with them and they keep playing with them week after week, and eventually they do something small with it and do something more, and you know like I wouldn't go into the playroom and do a demonstration with water and a sand tray' (PT7). The children's feedback in the later stage would make it possible to determine how easy and simple the Magic Land is to use in practice.

Design requirement 4: Create a safe virtual environment for free play with no rules, but opportunities for self-expression; introduce no structure but opportunities for:

(i) storytelling;
(ii) creative activities;
(iii) fantasy play;
(iv) emotional expression;
(v) new play activities inaccessible in traditional playrooms.

As was discussed earlier under the 'user-friendly' requirement (section 4.2.1), the therapists suggested making the application safer by introducing warm and friendly images. The child should know what to expect in each of the rooms. They also suggested turning the rooms

themselves into different buildings with an outside area that would make it seem safer for the child to go in and play. In such environments children would be able to see that nothing is hidden, which would allow them to open up more: *'I don't know whether it is unrealistic of me to suggest that there would actually be 5 or 6 different buildings?' (PT7) 'Can they actually play outside the castle? ...it would be less scary' (PT2)*.

Moreover, the therapists did not think it was useful to have a virtual Doll's House, Battlefield, Basement and Rosebush as separate rooms for the child's storytelling and emotional expression. There was much discussion about the usefulness of Rosebush as an assessment package. Since non-directive play therapy is not in favour of the assessment of children (Carmichael, 2006), it was agreed that some features of this application would be retained, but that it would not be used as the assessment package, at least not at this stage: *'I wouldn't say that it could be an assessment, maybe it would be one of the things that children could do' (PT7)*.

The Doll's House in the first prototype appeared to the therapists to be very similar to a traditional doll's house but without the advantages of sensory play. In order to turn it into something that enhanced, rather than limited, a child's normal play, therefore, it would have to include more images and allow for the changing of characters' emotional expressions in a way that was flexible and easy for the child. Therefore, the decision to use a drawing and erasing option, instead of complex programme features such as Poser, was made. In other words, the child would be able to use the eraser to rub out the character's facial expression and create a new one by drawing a new face.

In addition, to enhance storytelling through virtual play in the Doll's House it was suggested that children be provided with avatars and imaginative heroes: *'… an opportunity for it not to be them who is going into the room but a figure' (PT4); '… that's a very good one' (PT1)*. The Basement room could be too frightening for children, but with avatars and

heroes they would be able to detach from the feeling of being frightened, because it would not be they who were exploring these scary places but the avatar, who is strong and brave. Such a combination of fantasy play and storytelling could be empowering for children: *'... the representation could be brave or scared for them so they can detach… just giving them that opportunity to be apart from it. It's fantasy' (PT4); '... they could choose their own character' (PT6), '... and might want to become Lancelot or a lion or a polar bear of the northern lights or something, or Lara Croft. Someone who could be brave on their behalf who would go in there' (PT4)*.

As for opportunities to release anger in the Battlefield room, the distinction between 'release' and 'expression' was made. The therapists argued that the *releasing* of anger has to be done bodily and cannot be accomplished through the visual processing of pictures on a computer screen. They thought it would still be possible to *express* anger, however, by drawing or changing the characters' faces. This could be done in an environment that would combine the Doll's House, Battlefield, Basement and Rosebush features in one. Also, the therapists' request that avatars be included to support fantasy play had been overlooked by the researcher. The therapists emphasised how important it is for children to have a hero who can explore and discover for them. It was thus decided that the Battlefield room should be excluded from the programme. Instead, in order to support a child's expression in creative and fantasy play further, the creative virtual objects like fireballs and ice cubes that had initially been put in the Battlefield room were moved to the Flying Feathers environment, which was described as *'a nice one, particularly for children with disabilities' (PT7).*

The Water and Sand room had been created to support emotional expression. The therapists, however, expressed concerns about it not being sensory, and thus not allowing for much expression through touch. This play was seen instead as a creative activity that enhances fantasy play and provides new play opportunities: *'it could be potentially useful... [traditional sand and water] can be messy, it's all sensory... but I have to*

really switch that part of my brain off... this is kind of exciting visual artistic creation activity' (PT7). 'I wonder if it would be possible for the child to do this and touch the tabletop and the water goes 'shhh' and dive into this? (PT1) 'Yes, because in that sense it could add something that the real thing can't have…' (PT4). Therefore, an option of making ripples, and the sounds of rain and thunder and swimming fish were introduced to make the application more sensory.

Design requirement 5: Impose no time limits on play

This design requirement is closely linked to the requirement of giving the child control over the application that was discussed earlier in this subsection. The fading in/out option interferes with both requirements - in the case of *Requirement 5*, by limiting the child's play. It was decided to take it off to encourage children to assume full control over their virtual play on the tabletop.

Design requirement 6: Create play with no winners/losers, no tasks or levels of difficulty; keep play activities free and unstructured

The first prototype of the application on the whole included no tasks, levels of difficulty or goals. The only exception to that was the Rosebush room that included a specific goal for the child's activity, which was to match how they were feeling with the pictures in the room. The presence of a task in child's play directs the child and makes play structured and goal-oriented, which, in turn, dilutes the essence of non-directive play therapy. This means that the second prototype Magic Land would have to be free from any goals or structures, and thus assessment packages.

Design requirement 7: Limit the use of the table to the application only

This requirement was not tested, as no children were involved in the evaluation at this stage.

Design requirement 8: Enable saving and printing of the child's work; ensure each child has a memory stick to save his or her work on.

The therapists expressed the same opinion as at the stage of formulating the design guidelines. While saving and printing the child's work could be useful in supervision and training, it would not be of much benefit in everyday practice: *'I think it's something that is likely to be used in a research arena, so if therapists wanted to research the use of the tabletop within play therapy then it would be helpful in that way. I'm not sure that it's that helpful on a day-to-day basis… of helping the therapist evaluate the child's use of things, because you see it's not how many times but how they did it, and that's what you're really processing and recording each time' (PT7)*.

Nevertheless, to ensure the children's confidentiality and to ensure that their creations would not be seen by other children, it was decided to use memory sticks as a way of saving and keeping safe any work they produced on the tabletop. The initial idea of having a password to unlock the application seemed to be too complex, especially for younger children. Memory sticks, on the contrary, are very easy to use since you can just put them into the tabletop and then take them out again. A memory stick assigned to each child could protect their confidentiality and make the data easily transferable from an interactive tabletop to a computer: *'How would you take it to supervision?'(PT3) '… on a memory stick?' (PT1) 'Wow, yeah' (PT3).* The tabletop would automatically recognise the memory stick and save only the work that the child wished to save on it by pressing the 'Save' button.

4.5 Further development and evaluation of Magic Land: Third Iterative Cycle

During the third iterative cycle the Magic Land was programmed into a working system and tested with children for its interface usability, as well as with the therapists to evaluate its appeal and suitability for real clinical contexts.

The Magic Land was programmed gradually, which allowed me to test its different 'rooms' or 'environments', as we called them at the time.

Later, when the iterations were done, we started referring to these 'environments' as 'digital toys'. I presented a list with design requirements together with an electronic prototype of the Magic Land, which I created in a doc. file. I also included pictures and images that I chose to use in the Magic Land based on the therapists' feedback and the design requirements. The programmer and I had frequent meetings to discuss and reflect on the software development and the accurate implementation of the design requirements. It was the programmer who chose the shape for the digital paint palette and the brush. Also, at my request he found an image of the 'exit button' to indicate the exit from the environments and the Magic land itself. In addition, it was extremely helpful that the programmer was present on campus. I did not have to wait until all the children had tested the Magic Land before the system could be iterated. On the contrary, each issue could be eliminated as soon as I had analysed the video after the child had finished using the software. This approach saved me time and speeded up the progress of the research.

4.5.1 Interface usability tests: Children's voice

As described in Chapter 3 on methodology, seven children aged 4-11 (who had not been referred for play therapy) played in an undirected manner with Magic Land for 30 minutes. Each session was video recorded and analysed to highlight any problems associated with usability. Since the children had not been referred for play therapy, the videos were not analysed to evaluate the extent to which the design requirements relating specifically to play therapy had been met. However, the researcher did seek to find out how easy/difficult it was to use Magic Land without instruction (*Design Requirements 2 & 3*), that is, the extent to which its functionality and capabilities were *discoverable* and the ease with which children incorporated the features into their play. All the children were asked 'How was it to play with the Magic Land?' Their answers were coded according to the non-verbal affective scale (see Chapter 3).

Table 6 presents the figures representing the children's engagement and how simple they found it to use Magic Land during interface. Out of seven children, six reported that Magic Land was easy to use and one said it was very easy to use. With regard to engagement, two children found it excellent and five – very good.

Simplicity of use		**Engagement**	
Easy	6	Excellent	2
Very easy	1	Very good	5

Table 6. Interface usability tests results

The findings suggest that no further changes needed to be made regarding *Design Requirements 2 & 3*. A number of technical problems were, however, discovered and corrected at this stage. In order to support the design requirement of '*Giving the child control and ensuring simplicity of the application for the child's independent use' (2),* a few changes were made to the layout of the Magic Land. For example, a top bar that indicated where all the images within each of the environments are kept was hard for children to reach. As they leant across the screen to choose the picture from the top bar, their bodies would touch the whole screen at many points. This, in turn, would send a signal to the picture bar telling it to disappear, making choosing any picture from it impossible. Therefore, the top bar had to be moved down to the central bottom part of the screen, making access easy and simple, so the children did not activate the screen points that made the bar close.

Figure 24. Picture bar moved to the bottom of the screen

Despite evaluating the Magic Land as easy to use, the children seemed to be confused about how to enter and exit the environments. For example, one of the girls spent about 10 minutes just looking at the main screen of the Magic Land, not knowing that clicking on some of the pictures would take her to a different environment by popping up a new screen. To make the features of the Magic Land more discoverable, the created environments had to be indicated on the main screen, as well as the exit from each of the environments back to the main page. Therefore, the labels of the environments (‘Rosebush’, ‘Flying Feathers’ etc.) were introduced on the main screen where the child could read them.

Having no information about what the Magic Land could offer, some of the children asked ‘What should I do?’ and ‘What now?’ It seemed that some expected the Magic Land to resemble other goal-oriented computer/DS games, while others approached it with a more open mind.

4.5.2 Mock therapy sessions: establishing safety for therapeutic use

In this subsection the outcomes of the mock therapy sessions are discussed. The main aim of conducting these mock therapy sessions was to determine whether the application would be safe for a real therapeutic context. Following the initial approach, I made a list of needed iterations based on the therapists' feedback and the video data analysis. I presented this list to the programmer who implemented the required changes digitally. This subsection also presents the changes made to Magic Land after the mock therapy trials.

The therapists perceived the application as a safe and exciting tool for non-directive play therapy: *'Yes that was good... it's amazing how you did that. Brilliant, I think. You've done a great job... they [children] will find it fascinating...' (PT2).* Nevertheless, Magic Land still needed further improvements. The main criticism was related to *Design Requirements 2, 3 & 8*. The changes that resulted from the feedback are presented below. According to *Requirements 2 & 3*, Magic Land has to be under the child's full control and be easy to use without instructions:

Design requirements 2 & 3: Give the child control and ensure simplicity of the application for the child's independent use; introduce no movements/prompts from the application unless initiated by the child; make contents of the application easily discoverable

The therapists' feedback after the mock therapy was consistent with the children's written feedback after the interface usability tests. The features of the application were reported to be easily discoverable and the process of discovering enjoyable and exciting: *'A lot of pleasure was in the discovery, and if the child chooses not to touch a particular icon but if they just discover it they might just go there' (PT5)*.

As mentioned earlier in the subsection on the interface usability test (subsection 4.5.1), despite stating that it was very easy to use Magic Land independently, the videos showed that it took some children nearly

ten minutes to discover how to choose various toys within Magic Land. Therefore, some alterations had to be made to the main screen. As it was pointed out in the previous subsection, written labels of the names of the environments were put on the main screen to indicate where the child should click on to enter these environments. The therapists expressed concerns about such labelling, as younger children who had not yet developed reading skills would not be able to read them: *'Younger children might... not be able to read and they might not know that they are going into water... maybe the images could be a bit more child-friendly' (PT5).* An inability to read the labels could explain why children took so long to discover how to enter Magic Land.

In a therapeutic context, this may put the child into the position of asking the therapist for instructions, with the result that the therapist ends up directing the child, which goes against the non-directive principle that *Design Requirement 2* aimed to support. To resolve this problem it was decided to include pictures next to the written labels so that both younger and older children could discover where to click independently.

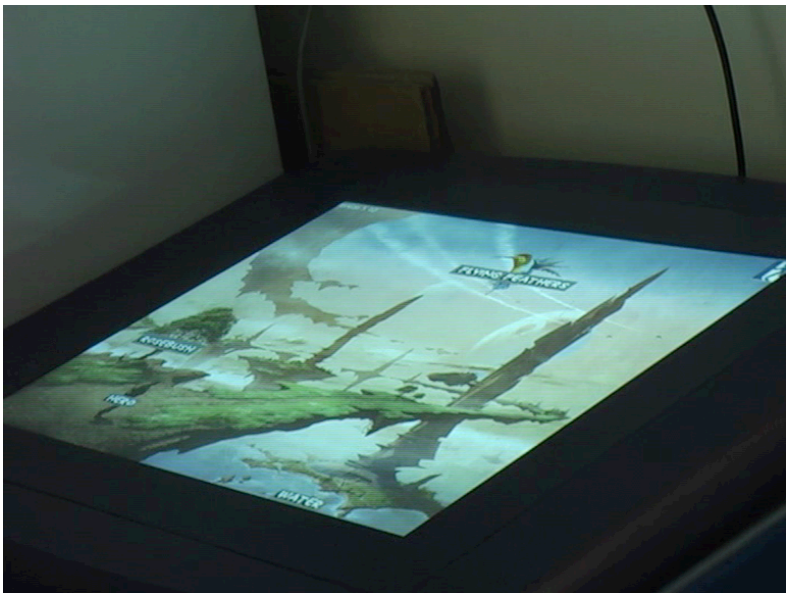

Figure 25. Labels on the home page of Magic Land

Finally, to support *Design Requirement 8*, a saving option was made available to the children in each of the environments so they would have easy access to their saved work at any time.

4.6 Final Prototype of Magic Land

In this section the final prototype of Magic Land is presented. It is demonstrated how the iteration of the initial prototypes was theory-based and practice-driven. Magic Land was developed based on the requirements described previously in this chapter. These requirements are relatively abstract and challenging both to design for and to evaluate, and Magic Land represents a first attempt to realise these requirements in the form of a working system. The numbers in brackets refer to the number assigned to the design requirement and the non-directive play therapy principle it is based upon (see section 4.2.1 for full description). The final version did not go through any further iteration and there was no need to implement any further changes in terms of programming.

The final prototype of Magic Land consists of four digital toys implemented as an integrated suite of multi-touch applications on a SMART Table: Flying Feathers to support creative and emotional expression, Rosebush to support storytelling, Hero/Avatar to support fantasy play and Water to support new play opportunities. Although each of the toys is said to perform one main function, as explained earlier, this was done to guide the design process only. As will be seen from the description of Magic Land below, each of the toys performs more than just one function, and there are composite, multilayered connections between the digital toys within the application that link them together and that reflect complex design requirements. In other words, the main aim of Rosebush is to support storytelling, but it also encourages fantasy and creative play. Hero/Avatar was designed mainly to support fantasy play, and also to create opportunities for storytelling and creativity and so on.

To support the principle of *Returning Responsibility to the Child and Letting the Child Lead*, the system was designed to give the child control and to ensure that it was simple enough for a child to use independently (*Design Requirements 2 & 3*). Therefore, indicators that represent the four digital toys were included on the 'home' screen of Magic Land. A child can open each specific toy by pressing on an image or on the corresponding written label that represents the toy on the screen. An exit button at the top right-hand corner of the screen allows the child to return to 'home' at any time.

Support for *Principle 8 - Reflect the Child's Feelings* – was implemented through enabling the therapist to save progress and particular choices on a memory stick (*Design Requirement 8*), so that a child's play is allowed to continue in a new session that begins at the point where the previous session ended. In order to support the first principle – *Develop a Warm and Friendly Relationship with the Child* – it was necessary that the system be designed explicitly to promote trust and to protect the child's privacy. Thus, the application was designed so that each child's play could be stored securely on a memory stick; this meant that access to the child's work would be restricted to the child and the therapist alone (*Design Requirements 1 & 8*).

In order to support the principle of *Recognising the Gradual Nature of the Therapeutic Process*, Magic Land does not have any time limits and is accessible to children at any point in time during their session (*5*). Further, as will be seen from the presentation of Magic Land below, it was designed to have neither winners/losers nor levels of difficulty, with the aim of reflecting the principle of *Accepting the Child Unconditionally* (*Design Requirement 6*). Magic Land is to be seen as a place of free play and expression, not as an assessment tool. The aim was to avoid including anything that would encourage therapists to make judgements or that would trigger children's self-judgement.

In addition to supporting the principle of *Reflecting the Child's Feelings*, Magic Land includes the facility to save and print the child's work (*Design Requirement 8*). As proposed by the therapists during the mock therapy trials (see subsection 4.2.1), a 'saving' function was included in each of the digital toys. Moreover, to encourage a greater degree of self-expression on the part of the child (*Design Requirement 4*), the transferring of images from one digital toy to another was enabled through a 'save and load' option. For example, the child's work or any images from a Hero/Avatar toy can be taken to the Flying Feathers toy and vice versa.

Environment 1 'Flying Feathers': Supporting Creative Expressions

Flying Feathers (Figure 26) responds to the expressive elements in the principles of *Accepting the Child Unconditionally and Establishing a Feeling of Permissiveness for the Child to Express Anything* by supporting a child's creative expression through painting, drawing, mixing colours and creating scenes in picture frames (*Design Requirement 4*). These options allow children to make art in the presence of the therapist, and thus enable them to connect with their feelings - particularly those that cannot be easily expressed in words (Wals & Verhulst, 2005). A wide palette was provided so that children could identify with and express a broad range of feelings (*Design Requirement 4-ii*). The aim in including these features was twofold. First, it was hoped that children's artistic creations, produced using the various painting and drawing tools included in the toy, would act as a 'container' for their powerful emotions; secondly, the aim of providing a wide palette was to give children plenty of scope for matching these emotions with different colours; if the child then explained the meanings of the artwork and of the colours to the therapist, the toy would be serving as a means of emotional expression (*Design Requirement 4-iv*) for the child.

Interactive tabletops enable play with elements that it would not be possible to use in a traditional play therapy room (such as playing with

floating feathers and snowflakes, lights, fire and ice, burning fireballs and frost frames, to change picture patterns). Tabletops also offer the facility of manipulating objects and images through a rotation, scale and move (RSM) function. Such possibilities for manipulation provide new creative outlets (*Design Requirement 4-ii*) that are not available in a traditional play therapy setting. As proposed by the therapists (see section), Magic Land enables creativity (*Design Requirement 4-ii*) through types of play that are normally impossible, impractical or dangerous in a normal play environment. This supports the principle of *Establishing a Feeling of Permissiveness to Express Anything* (*Design Requirement 4*) as well as that of *Returning Responsibility to the Child*, by making it possible for children to manipulate and master objects that would normally be outside of their control (*Design Requirements 2 & 3*).

Figure 26. *Flying Feathers*: Supporting Creative Expression

Environment 2 'Rosebush': Supporting Storytelling and Emotional Expression

Following a non-directive approach, Rosebush (Figure 27) supports storytelling, evoking a *Feeling of Permissiveness to Express Anything (Design Requirement 4*). In this toy, images of trees, flowers and animals become the child's language, allowing him or her to create environments and stories and, thus, to develop an understanding of and

explore feelings about real-life events. The images of animals, people, blobby characters and environments were included to encourage the expression of common themes in children's play that the therapist would be looking for: goodness-badness; power-powerlessness; dependence-independence; helpfulness-unhelpfulness (Munns, 2011).

As required by the therapists, dark pictures were avoided and 'friendly and welcoming' images included (see iterative cycle 1). Blobby characters with a variety of emotional expressions are used in traditional play therapy to help children express their feelings. An effort was made to enhance the traditional use of these characters, by giving children the ability to change the facial expressions (thereby further externalising these expressions) of the characters by drawing on them (*Design Requirement 4*). With the aim of *Letting the Child Lead*, a range of objects were also included that could be appropriated by children according to their wishes and imagination. It was hoped that this feature would encourage metaphorical and symbolic play (e.g., a child could re-imagine a stick as a sword for use in a storytelling scenario), which is the basis for fantasy play (*Design Requirement 4-iii*). Here, the advantage of the digital representation and interaction is that the child can manipulate the objects (through the scale and rotation function) to support fantasy, symbolic play and expression in ways that are not so easily achieved with traditional toys.

Figure 27. Rosebush: Supporting Storytelling

Environment 3 'Hero/Avatar': Supporting Fantasy Play

Hero/Avatar (Figure 28) gives further support to the child's creative expression and fantasy play (*Design Requirement 4-ii/iii*). To support the *Establishment of a Feeling of Permissiveness to Express Anything*, it was deemed necessary to empower the child through imaginative creative play with avatars and superheroes (*Design Requirement 4-iii*). Rather than providing a set of already famous superheroes (e.g., Batman or Wonder Woman), Hero/Avatar encourages further creativity by enabling children to create their own heroes. The child can choose from a range of different options (artist-developed male/female/child bodies; skin; eyes; ears; clothes; boots; gloves; necklaces; companions; wings and auras) to create a hero of his or her own imagining. Swords and magic weapons are also included to promote the child's empowerment through imaginative play. Like Rosebush, the pictures in Hero/Avatar reflect the themes of goodness-badness, power-powerlessness etc. The child can colour and resize the hero, and also use it in other applications.

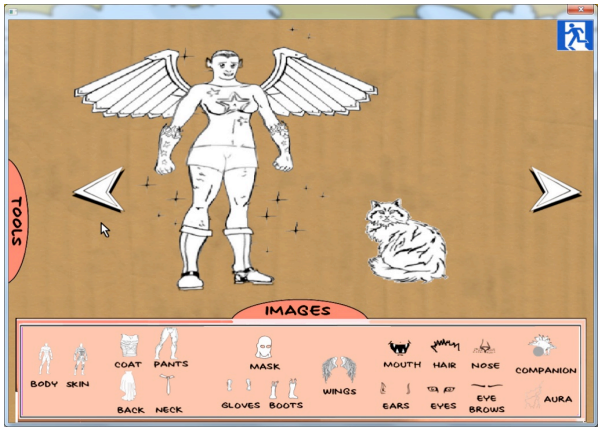

Figure 28. *Hero/Avatar*: Supporting Imaginative Play

Environment 4 'Water': Supporting New Play Opportunities

The final application in Magic Land, Water (Figure 29), encourages the child's self-expression by again creating opportunities for play that cannot be offered in a traditional play therapy room environment (*Design Requirement 4-v*). The Water application allows the child to play joyfully with water. Joyful play has two principal therapeutic benefits: (i) it

contributes to a sense of happiness and well-being, and (ii) it is a powerful antidote to the stress of living (Sallman, 2007). Opportunities were created for children to make ripples, add pebbles and various stones, ships, shells etc. It also includes the sounds of rain and thunder and the corresponding visual effects created on the surface of the water to explore the possibility and potential benefits of bringing music and play therapy together (see formulation of design requirements, subsection 2.4.1).

The child can also add and remove fish, which swim around the surface of the screen and are responsive to the child's touch. In the UK, play therapy sessions are typically conducted in school buildings; Water offers children a life-like natural environment experience as a contrasting alternative. The child has full control over the fish, rain, water and other features, and no movement of the objects is possible unless initiated by the child (*Design Requirements 2 & 3*).

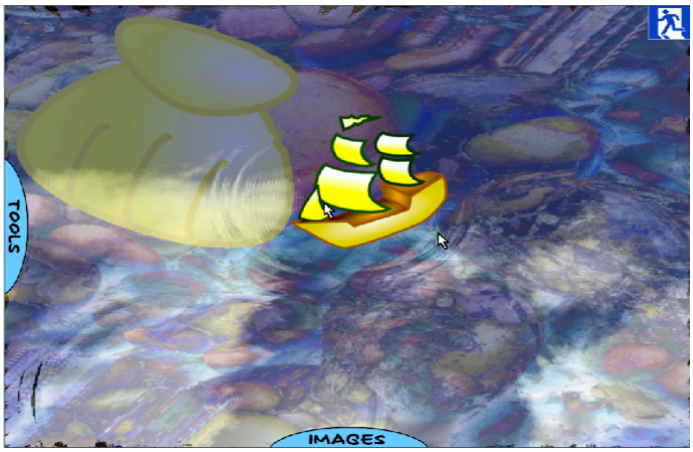

Figure 29. *Water*: Supporting New Play Opportunities.

4.7 Part 2. Magic Land in the context of Non-Directive Play Therapy

Having developed a final prototype of the application and established its technical reliability and safety for therapeutic use with children, the study further investigated how the application could support non-directive play therapy.

Research Question 2: 'How, if at all, could a novel digital toy like Magic Land on an interactive tabletop support non-directive play therapy?'

The non-directive play therapy principles were used as the theoretical framework for the data analysis. Table 7 summarises the sub-themes related to each main theme and is followed by a detailed presentation of the findings.

Themes	Sub-themes
1. Developing a Warm and Friendly Relationship	*Motivation & Engagement;* *Safety, Trust & Empowerment;* *Limiting Talk and Excluding Therapist;* *Personal Space to Connect with One's Feelings;* *Dependent on Therapist's skills*
2 & 3. Returning Responsibility to the Child/Letting the Child Lead	*Promoting a sense of mastery and staying in control;* *Novelty factor as a barrier to staying in full control*
4. Establishing a Feeling of Permissiveness for the Child to Express Anything	*Expression of fearful and angry feelings;* *Enhanced Creative Expression:* *(i) greater flexibility;* *(ii) voicing silent experiences;* *(iii) familiar but previously inaccessible medium of creative expression* *New mode of Fantasy Play;* *Enhanced Role-Play;* *Limited Emotional Expression through Digital Characters;* *Promotion of Relaxation & Peaceful Feelings;* *Encouragement of Experience of Joy, Fun and Pleasure*
5. Recognising the Gradual Nature of the Therapeutic Process	*Child's Right to Choose Toys*
6. Accepting the Child Unconditionally	*Taking pressure off*
7. Setting Necessary Limits	*Child's curiosity and misconduct*
8. Reflecting the Child's Feelings	*Monitoring Therapy;* *Protecting Privacy*

Table 7. Magic Land in the context of non-directive play therapy

4.7.1 Developing a Warm and Friendly Relationship

Motivation & Engagement

There were no reports or observations in either the mock therapy sessions or real-world deployments indicating that either Magic Land or the interactive tabletop itself negatively influenced the child/therapist relationship or interrupted the therapeutic process. This means that the application is certainly not threatening but is in fact safe for the building of a relationship between therapist and child: *'it certainly didn't do the therapeutic process any harm, and, if anything, it gives them an interest, got them engaged' (PT5, pilot study).* This was further supported during the main study: *'I didn't find that technology put a stop to relationship building. I would never think that having that in front of me could damage rapport. I don't feel that at all. …if anything, the kids wanted you to be involved with them... I wouldn't say that it was any different from any other medium... (PT12)*.

On the contrary, Magic Land, as well as the hardware, served as an icebreaker, sparking the children's interest and increasing their motivation to come for play therapy. This added to the relationship building by engaging the children more easily: '*It's been really helpful... it wasn't like 'Oh, I'm in this weird space and this weird lady wants me to play'; it was just 'Oh, look at this really cool table that I'm going to check out', and so we were able to move past that kind of uncomfortableness in like the first session' (PT9)*.

Features of the hardware such as the large screen size and the seating arrangements allowed the therapist to observe the child's work at any moment. Although sometimes children would remain quiet during the first session with the therapist, the relationship building would still be taking place simply as a result of their sharing the same space around the tabletop and engaging in non-verbal communication through body language and eye contact. For example, Neil was silent while exploring the Magic Land in his first session with PT11. He did, however, look at the therapist every 20-30 seconds as if checking his reaction to what he

was creating on the screen. Every time Neil discovered a new feature (resizing, mixing colours etc.), he would look straight into PT11's eyes, holding his attention until the therapist nodded his head, smiled or reflected verbally what Neil was doing. This silent communication, if voiced, might have taken the form of the child saying 'Look what I can do!' and the therapist answering 'Yes, I see you. I am here for you. I'm giving you my full attention and I can see what you are doing'.

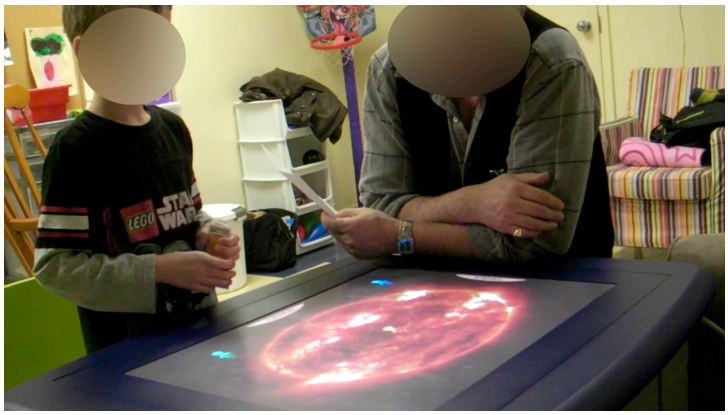

Figure 30. Silent communication

Other children, like Ted, demonstrated their engagement with the therapy process by giving the therapist a verbal invitation to join in their play in the first 5 minutes of their therapy session. For example, while PT11 was explaining the purpose of the present research to Ted's parents, Ted was exploring the Magic Land on his own. The child worked out how to resize images in the first three minutes. He got so excited about his discovery that he shouted to PT11: 'Look what I've done!!! I can move it... Have a look at what I can do!' In that moment, the therapist did not seem to be a stranger to the child. It looked as though Ted was treating PT11 as his playmate, whom he wanted to engage with. PT11 had nothing to do but come to the table and start the session, as Ted explicitly invited him to join in and witness his creations in the Magic Land.

Figure 31. Ted's first meeting with the tabletop

In addition, the therapists thought that Magic Land helped to engage children in therapy by taking the focus off them and placing it on the interactive medium of Magic Land. One of the examples that illustrated this point was observed in Rick's first therapy session when he said that he could not speak and he felt really nervous: *'As if I'm being watched by many [on the stage]' (Rick, video 1).* His therapist, PT11, drew Rick's attention to his paintings on the tabletop. Once the attention was placed on Magic Land, Rick relaxed and engaged in a conversation with PT11 more easily, expressing his angry feelings towards his sister, whom he found annoying.

Safety, Trust and Empowerment

The therapists perceived Magic Land as *'friendly and non-threatening' (PT9)*. Since all dark and potentially frightening pictures had been taken off, as requested by the therapists during the initial evaluation, there were no comments about the application being frightening for the child in the pilot and main study stages. It was perceived as being *'pretty safe'* for the child *(PT10).* When talking about safety, the therapists also referred to the robustness of the hardware: *'they [children] can hammer on it and it doesn't break... it's a really solid table... (PT9)*.

Further, the software seemed to promote a sense of trust and safety owing to the fact that it was a familiar medium in the children's lives. The therapists reported that children related to technology easily, and once they saw that the therapist could relate to the technology too, it was like granting the therapist acceptance and permission to enter the child's world: *'... an entry... it's like the relationship changes because I know something they know... speaking their language' (PT10).* Also, the therapists thought that the technology *'levelled up the power'* between the child and the therapist, which was beneficial for relationship building. They reported that the technology put the children into a position where they could take the initiative to teach the therapists. This was seen as empowering for children as it boosted their self-esteem: '*You kind of meet them at the level where you can take something from them... it's very positive' (PT9)*.

Limiting talk and excluding the therapist

During the pilot study Magic Land was perceived as something that interrupted the child's usual talk. During the real-world deployment stage, however, the therapists argued for the importance of being able to follow the child's play with any toys, even computerised toys. In other words, they believed that it is the therapist's ability to follow the child and not the toy itself that triggers the child's talk. Some therapists also expressed a desire to be involved in a child's play in Magic Land by explicitly including features that would allow them do something together with the child. For example, the therapist in the pilot study sometimes felt excluded from the relationship because the child played on the tabletop by herself, without inviting the therapist to join in her play: *'With the tabletop it's the child… does something and I feel left out, I'm not engaged with her, and with the tabletop the child is making a picture and I'm [just] observing it' (PT5, pilot study)*.

What constitutes best practice in non-directive therapy is a matter of debate. Indeed, when a similar issue arose in a mock therapy session discussion, one of the therapists argued that their role in non-directive

therapy is to observe and reflect rather than participate (unless invited) in the child's play. In addition, a child's invitation to play could indicate growing trust and relationship development: *'maybe as a child you would hold that [invitation] and as the relationship developed there would be an invitation, so that could be significant as well' (PT4, mock trials).* As the videos showed, the children in the main study did invite their therapists to participate in their play or at least witness their digital creations. Sometimes the invitation was instant and explicit, while at other times it took longer to emerge. However, even when the therapists did not participate in the children's play, they were still participating in observing the children and witnessing their actions and emotions around the tabletop. As mentioned earlier in this section, it was found that even when the therapist and the child were not interacting or communicating verbally, silent communication was taking place between them by means of body language and shared emotions.

Providing personal space to connect with one's feelings

Another point of view that was actively argued is that the reason why the therapist was not always invited into the child's play is because Magic Land helped children get in touch with their feelings, and thus they sometimes remained quiet, but this did not necessarily mean that they were not building a relationship: *'they're so focused that I don't exist... at the same time the relationship is still there... they need to process whatever we're doing' (PT10, main study).* Magic Land aided in the development of the relationship by providing the child with a personal space where he or she could be expressive in a non-verbal way. This was shown to be particularly beneficial for children from big families with many siblings and relatives: '*Magic Land really helped develop a therapeutic relationship... because he just had that quiet space. He has three siblings so it's very busy and he's the one of the middle children... the difficult one and so... it was just kind of one-to-one quiet... which is really helpful for him' (PT9, main study)*.

Interestingly, the videos showed that the Water application and images of fireballs created opportunities for children to speak about their deepest feelings and home situations simply by looking at the water and fire without even playing with them. Just having the fire burning or the water running was often sufficient for the child to start talking. T11 suggested that the reason the digital water and fire served as media for communication was that these natural forces have long been means of gathering people together - since tribal times. Whether it was considered as a means of natural connection on a subconscious level or as a tool for taking the focus off the person who is speaking, it was evident that the Magic Land allowed children to connect with their feelings and express them in a verbal way.

Dependent on therapists' skills

Although they agreed that using the Magic Land application on the interactive tabletop had the potential for supporting the development of a warm and friendly relationship, the therapists emphasised the fact that it would be wrong to think that the technology could create a trusting relationship between therapist and child without any input from the therapist. Unsurprisingly, they maintained that it is therapists' skills that should be accorded the most importance in this process. In other words, it is likely that the software and interactive tabletops will only work in the hands of a professional therapist who knows how to use the technology: *'it comes back to the person...who is using it with a client' (PT9, main study)*.

4.7.2 Returning Responsibility to the Child/Letting the Child Lead

Promoting a sense of mastery and staying in control

Unlike traditional computer games, which are based on the achievement of goals, the Magic Land was perceived by the therapists to give children full control over both 'what' to do and 'how' to do it. For example, the children were in full control of creating their own characters in the Hero/Avatar toy, deciding what they would look like, *'whether they*

would have a body or not' (PT9, main study). Since there were no set tasks, the therapists acknowledged that the design allowed children to go in and out of the Magic Land at any time, as well as to follow their inner guidance in choosing digital toys and play themes. The Magic Land was reported to be therapeutically beneficial owing to the fact that it enabled children to lead and remain in control, activating the child's sense of mastery:

'He's the youngest of three boys, he doesn't feel like he has a lot of control, mum gets to make a lot of choices and a lot of decisions... but I think he doesn't feel like he has a lot of mastery over a lot of things and he gets to make a lot of choices [in Magic Land] and... he's leading, he gets to be in control... which is really helpful for him' (PT9, main study).

Owing to the simple and intuitive design of Magic Land, the therapists perceived the application as *'very clear, very simple' (PT9, main study),* which also contributed to encouraging children to direct their own play on the tabletop without the therapist's instructions. The therapists reported that there was a lot of pleasure in the exploration and discovery processes. As noted earlier, being a familiar medium in a child's life, technology levelled up the power relations between child and therapist, thus contributing to the child's sense of competence and mastery. The Magic Land enabled children to *'do it on their own'; 'he was like, I can totally master this, you don't need to tell me anything' (PT9, main study)*. It was said that *'... even a two-year-old can go on the table...' (PT10, main study)*.

Although in non-directive play therapy the therapist has to follow the child's lead, occasionally the therapists seemed to adopt more directive approach to their work. For example, in his sessions with Rick, T11 would ask the child questions to break his long silences. The videos showed that when T11 could not get Rick to answer his question 'How are you feeling?' he attempted to use drawing tools in the Magic Land to attract Rick's attention in that way. However, as he did not know how to

use a digital eraser in the Rosebush application, the therapist failed in his attempt. Having worked out what T11 was trying to do, the child smiled, making an effort not to laugh at T11's attempts. The therapist found himself in the position of having to ask for help and Rick immediately helped him to use the eraser, which put Rick in charge of the situation and levelled up the power relations between PT11 and the child. Now the direction of what was to happen next was coming from Rick and not from the therapist. Therefore, the Magic Land served as a tool to level up the power relations, and supported the non-directive play therapy principle of letting the child lead.

A similar situation was observed in PT9's sessions with Tom, who had problems with his acting out behaviour in school. While role-playing Tom said to PT9: *'Let's play rough'*, to which PT9 replied: *'I'm not allowed to play rough. My mum says not to play rough. My daddy says not to play rough. My teacher says not to play rough. I don't think I can play rough. I don't want to get hurt. What can I do instead of playing rough?'*
Clearly, the therapist did not follow the child's need to 'play rough' but instead denied this need, saying it was not allowed. Interestingly, the child did not respond directly to PT9's question but moved to the tabletop to create superheroes and role-play 'rough' digitally. This could mean that the Magic Land allowed the child to stay in charge of his play and supported his need to express what needed to be expressed without PT9's involvement in the play.

The therapists thought that the Water toy in Magic Land encouraged a sense of mastery, because children are in full control of the water and the fish that can be added and taken off in a simple click: *'probably he uses Water the most because... you tap and you get ripples... he can tap, the fish come, he can tap and the fish are gone, and you know so he has this kind of mastery of I can take things away and put them back kind of thing' (PT9, main study)*.

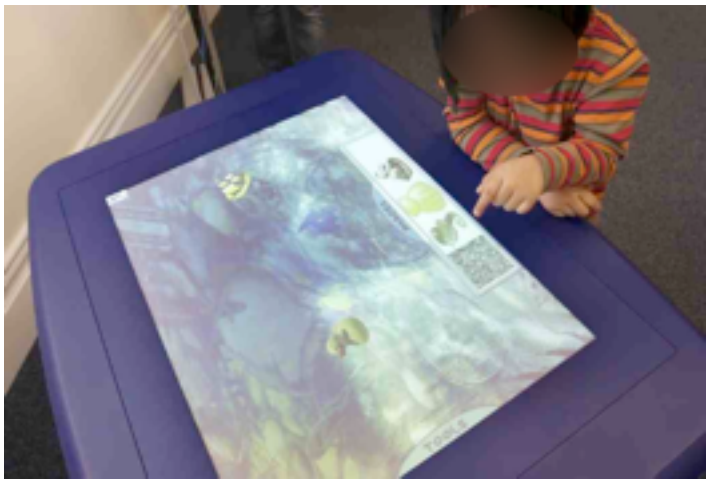

Figure 32. Water toy (Interface usability test)

In addition, the fireballs in the Flying Feathers toy were reported to encourage the children to experiment and explore in a safe environment. In one of the interface usability tests one child played constantly with the fireballs. As it turned out, his play was preceded by a fire alarm having been set off in their house the previous night. This child persistently made very large fireballs, then resized them so they became very small and then vanished. After the play the child said '*I can't play with fire at home but here I can!*'

During a mock therapy session an adult playing the role of the child experimented with floating snowflakes to deal with an anxiety about flying. She made the snowflakes fly to show how cold it was up in the sky and made them stop floating to create a warm scene with a tree deeply rooted into the ground. These examples suggest that the children were exploring and gaining a sense of control and mastery over their fears by playing with otherwise inaccessible toys in a safe environment. During the main study the therapists said they thought that such play was empowering for children since it gave them the opportunity to be in control of things that in any other environment would have been considered dangerous: *'it does allow you to play with fire, which you're not allowed to play with, and allows you to be the hero and stuff like that' (PT9, main study). 'It's like, oh I can touch the fire...it's not doing*

anything, it's not burning me, it's just making a sound' (PT10, main study).

Figure 33.Play with fire (interface usability tests)

In addition, the hardware of an interactive tabletop itself was thought to support the children's being in control of their play. For example, when a child sits at one side of the tabletop facing the Magic Land options, there is not enough space for the therapist to sit on the same side with the child. Instead, the therapist has to sit either opposite or at one end of the table observing the Magic Land from the side.

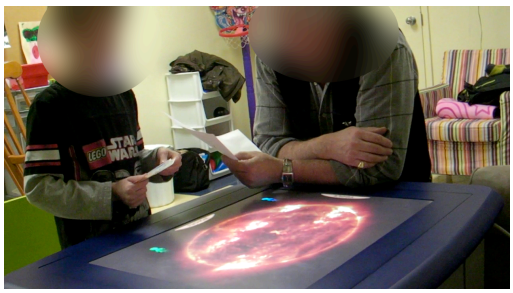

Figure 34. Sitting arrangements around the tabletop

This sitting arrangement allows children to feel that they are in charge of Magic Land and of the tabletop itself. At the same time, by sharing the same space, the therapist has easy access to and good visibility of the child's work on the surface that supports the feeling of

connectedness between the two, including rather than excluding the therapist.

Novelty factor as a barrier to staying in full control

Although the therapists had already stated that they thought the design of the application was easily discoverable and the process of exploration enjoyable, they then contradicted this view by expressing concerns about the child's non-familiarity with Magic Land. They reported that the discovery process would take some time and even then the child might not have *'access to the whole picture' (PT9, main study)*. In other words, unlike traditional toys that the child is familiar with, the fact that they do not know what the technology can offer may become a barrier preventing them from making full use of Magic Land: *' 'cos that's a new thing so they're not aware of what they can do on it' (PT10, main study).*

Moreover, therapist PT12 reported that it was especially hard for them to be able to support the non-directive approach because they had to show the child what Magic Land could do, otherwise the child may not know. Interestingly, as the videos show, the therapists started explaining the application options to the children in the very first session: *'I have no idea if they [children] would discover that on their own. Maybe over time... but for me I'm like, I don't know if she [the child] is going to figure it out unless I let her know' (PT12, main study).* This gives rise to the question of whose need it actually is, the child's or the therapist's, to make sure that the child discovered ALL the functions of the Magic Land during the first interactions with it.

4.7.3 Establishing a feeling of permissiveness to express anything

Expression of fearful and angry feelings

Although during the design stages the therapists requested that dark and frightening images be excluded in order to help children to feel safe and trusting, they also thought that this resulted in limiting children's expression of fearful feelings and bad experiences. As one of the therapists said, Magic Land is *'too bright and too positive for me'*; '*there's*

a few different things that you can put on, so [child] put on a bee saying that she felt like she had been stung and stuff like that, so she was able to express through those characters...' (PT12).

Magic Land was reported to support the child's self-expression through storytelling, but the digital toy Rosebush was criticised for its lack of images of blobby characters, background pictures, animals and people. It was said it could be *'great'* for storytelling *(PT12, main study)* if there was a greater variety of these pictures: *'I think it could make it more complete 'cos right now the kids get kind of bored easily because there's not enough' (PT10, main study).* In addition, the images and options currently included in Rosebush were criticised for being 'non-interactive'. For example, Tom, a child who PT9 worked with, asked explicitly *'How do you make them [characters] do something?' (main study)*.

Interestingly, static images and the absence of prompts and system-initiated activity was one of the design requirements discussed earlier (see subsection 4.2.1). This was intentionally done at the therapists' request during the design stage in order to enable the child to stay in control, thus supporting non-directive play therapy *Principles 2 & 3*: *Returning Responsibility to the Child* and *Letting the Child Lead*. Nevertheless, the therapists expressed a completely different opinion in the later stages. They speculated that if things were more interactive in the Rosebush toy, children would have more freedom to express themselves in storytelling instead of just creating a picture: *'because of where it stands right now it's not a lot of story, it's not a lot of that kind of interactive play that it's just a solitary activity at this point' (PT9, main study)*. Therefore, as a tool, Magic Land seems not to allow for a wide variety of emotional expression owing to the limited number of pictures, especially dark ones that could be used for expressing negative emotions and replaying painful experiences.

The videos, however, showed that the Flying Feathers and Rosebush applications were used by children to express their feelings of

anger. For instance, Neil, a seven-year-old child, had come to therapy to work on his feelings of anger. During the sessions he mainly used fireballs and pictures of flames. PT11 asked him *'How are you? How are things at school? How does it make you feel?'* Neil did not reply to any of these questions but continued playing with the fireballs, making them big and loud. In the next session T11 asked: *'Does it feel like fire when dad is yelling at you?*' to which Neil replied: *'sort of*'. The child used fireballs and a burning solstice image most of the time during his sessions.

Figure 35. Neil using fireballs to express anger

Another example of using the Rosebush application for the expression of feelings could be seen in the videos of Rick's therapy. When talking about Rick's feelings of anger, PT11 asked *'What makes you angry?*' Rick: *'My sister... different parts of maths [that I can't do]... school, parents getting mad at me.'* As this conversation was taking place, PT11 reflected Rick's answers by drawing the things that Rick was mentioning on the screen, making them visible.

Figure 36. Rick talking about anger

In the next session Rick used the Rosebush application to describe his feelings of anger towards his sister who was repeatedly teasing him. He started creating an image of a blossoming cherry tree saying: *'This is how I usually am when my sister is not annoying me... peaceful... relaxed'* (Figure 37).

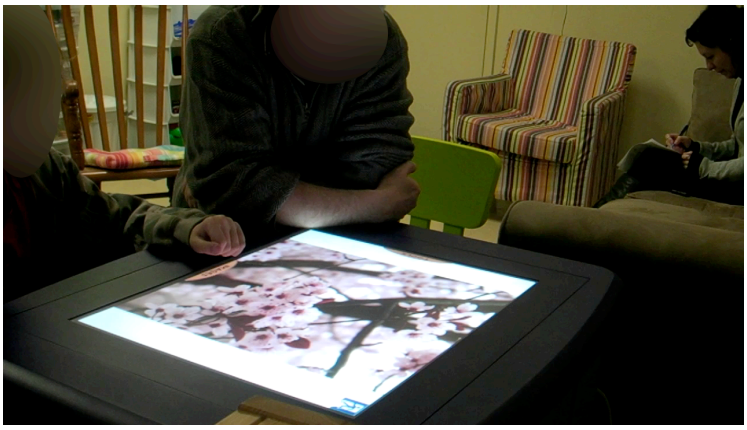

Figure 37. Rick expressing peacefulness

Then Rick went on to describe how his feelings change when his sister enters the room: *'loss of peacefulness'*. He picked a red colour and made a crossed circle over the blossoming tree saying '*that's the best way to describe it in a picture form'* (Figure 38).

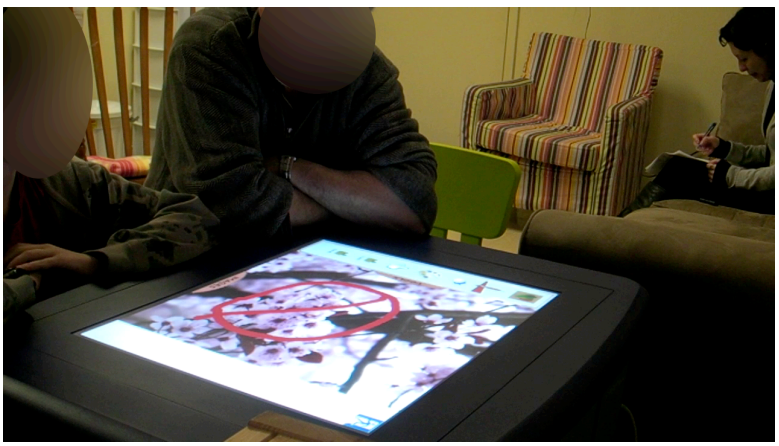

Figure 38. Rick's symbolic expression of his loss of peacefulness

The next image Rick created, which he called '*my anger and frustration'*, looked like a fireball (Figure 39).

Figure 39. Rick expressing his anger and frustration

He said that at this stage that he would take a pillow and punch it really hard to express his angry emotions. This strategy helped him to *'cool down'*; first he felt like the image of the fire solstice, half covered in blue, and then like a piece of ice (Figure 40).

Figure 40. Rick's symbols for 'cooling down'

The above example demonstrates how children can use Magic Land to name and express their feelings, particularly those related to anger and frustration. Interestingly, the videos also showed that the Magic Land was used as a tool to express a child's angry feelings in a safe and creative way. This was best observed in Ted's sessions. When PT11 asked Ted to clean the room as his parents came in to pick him up, the child started crying, which looked like the beginning of the sort of

tantrum he used to have at the end of sessions in the past. Seeing what was happening, PT11 quietly moved away from the toys on the floor and made a drawing on the Magic Land. This action immediately attracted the attention of Ted who joined PT11 at the tabletop. The child made a drawing of his own and smiled at the therapist. Then Ted started painting over the therapist's picture, saying, *'Look what I've done to your drawings! You'll never see them again'*. (Figure 41)

Figure 41. Ted expressing a protest against the therapist

Ted's actions could be interpreted as a way of expressing his disagreement and as a protest against PT11's wanting to end the session. It suggests that the Magic Land allowed the child to express his anger and unwillingness to leave in a safe, creative way. Ted continued painting over the picture until he had created a new colour: *'Ahhh, mum, look I've made it pink!!!!'* Ted seemed to be really proud of himself as he was smiling and screaming it out with excitement. PT11 reminded the child again: '*That's it for today'*. Ted would still not give up: *'I don't want to go yet... I want to play'*. Only after the therapist suggested that Ted shut the tabletop down did the child agree to leave. Although in tears, he left the room without screaming and throwing a tantrum. It seemed that the child's interest in Magic Land and PT11's method of using the Magic Land as a tool to deal with the situation allowed Ted express his feelings of anger in a safe and balanced way.

Enhanced Creative Expression

(i) greater flexibility

Magic Land and the interactive table itself were perceived to encourage the child's creativity: *'I mean definitely… [it gives] children…*

the ability to express creativity... for sure it does' (PT12, main study). Creative expression was enabled through the resizing/rotating options when children manipulated the size of images to express something about the character represented by that image. For example, Tom was resizing a torch to its biggest possible form, saying *'It's my dad' (Tom, video 5)*, although there was no explanation as to why he thought his dad resembled the torch.

Tom: 'I like it this size. It's the size of my dad' (enlarging the torch).
'He is that big. I'm little' (making another torch very small) (Figure 42).

Figure 42. Tom experimenting with resizing of the objects

All the children experimented with the size of images, making them very small and extremely big.

Figure 43. An example of resized images created by the children

The therapists struggled to say what feelings exactly children could express through a resizing option. In some cases it seemed to promote a sense of mastery and empowerment simply by enabling the child to make a small image big and then turn it into a tiny one, or even to make it disappear from the screen entirely with just a hand movement. Resizing also seemed to support a child's symbolic expression of feelings: *'... she created… a… almost looked like a solar eclipse... she actually made that into her anger and she put herself at the top with all the happy creatures and all the angry ones at the bottom... expressing her triumph over anger... so she was big and the anger shrunk and she actually ended up swooshing all that away' (PT12, main study)*.

The digital drawing, colouring and mixing colours options in Magic Land were also perceived as means to encourage creative expression in a new way. Colouring and mixing colours were said to be *'amazing... most of the kids just love [them]...' (PT10, main study)* because they give the child freedom to create new colour shades and experience them.

Figure 44. An example of colour mixing

There was a single point of view that digital drawing limited creative expression because *'if they [children] wanted to draw a dog... the line always skips so they have to go over it again, unlike a pencil that would be smooth and flowing through (PT12, main study)*. This point of

view, however, was not supported by the other therapists during the mock trials, or during the pilot and main studies. On the contrary, digital drawing was said to enhance the child's creativity and to be *'easier... it's just like playing in mud or playing with something; it's directly they're doing it with no medium between them... like their finger can be a paintbrush.... look it's coming out of my hand...' (PT10, main study)*. Jenny, one of the children who PT10 worked with, tried to paint with her face and nose, saying '*my nose is making this' (PT10, main study).* Nevertheless, the point that digital drawing is not smooth enough has to be taken into consideration. The issue of skipping lines during drawing is probably linked to the technical side of the Magic Land. This means that for technology to enable enhanced creative expression fully there should be no technical problems at all.

Figure 45. Jenny drawing with her nose

(ii) voicing silent experiences

Furthermore, the therapists reported that the children used Magic Land as a tool for creative expression by playing with the sounds of rain available in Water and the sound of fire burning in the Flying Feathers toy. The creation of snapshots and the combination of those snapshots with sounds were seen to play an important role in enhancing the child's

expression and making it more visible and voiced: *'it has something to do with being able to create sound… which I think takes it beyond the level of just creating an image... it's like putting it out into the world a little bit more... because I think as a culture we're kind of taught to like be quiet' (PT12, main study)*.

(iii) familiar but previously inaccessible medium of creative expression

The interactive tabletop itself was also perceived to encourage the child's creative expression, since it is a toy that was previously unavailable in a play therapy room, for those children who love technology and find it a familiar tool. The therapists argued that not every child is *a 'sand box player'* and not everybody is *'a talker'*, but most children are comfortable with technology. Therefore, Magic Land enabled some children to express themselves through *'their own medium of expression'*, becoming just *'another way of expression' (PT9, main study)* that was made available for the child in the playroom. Another argument to support the availability of Magic Land in the playroom was that with some children it is difficult to get them off their computers and play stations. Thus, Magic Land creates opportunities to *'replace whatever they are doing' (PT10, main study)* with something that will enhance their sense of well-being.

Figure 46. Previously inaccessible digital drawing (pilot study)

Fantasy play

Magic Land aimed to support fantasy play through developing the Hero/Avatar toy that allows children to create their own characters. The therapists thought that unlike traditional superhero toys, Hero/Avatar supported fantasy play by enabling children to make their own avatars according to their personal vision. The Hero/Avatar toy gave the child freedom and flexibility to explore what this hero could look like and what companions he/she could have without creating a *'preconceived notion as to what that character does. It's something that they've created so it's not like, here's Spiderman and so I have to stick to the Spiderman story; it's like, here's this guy that I've created from the ground up and he can have any names he wants and he can be any colour he wants... and I think that's really important because... you can be a man, you can be a woman... my little guy was creating a Hero - he didn't put a body on him. It was just like boots and like the rest of it... and he doesn't have to have that bit so he can be whatever you want him to be' (PT9, main study)*.

Despite the prevailing opinion that the Hero/Avatar toy supported fantasy play, one therapist found it *'not suited to children' (PT12, main study)*. This therapist thought that the templates provided for the child looked like fully developed males and females. Instead, it was suggested including images to create a family: *'...like Hero is very like mystical, like fantasy play, but [it would be good to include] more real [images] that they could create... a mum and dad and brothers and sisters... your family... and then put your family onto the backgrounds' (PT12, main study).*

Interestingly, the therapist defined the Hero/Avatar toy as '*something for fantasy play'* and that is exactly what it was designed for. Having criticised Hero/Avatar for being mystical and not realistic enough, she also suggested having *'... more mystical things... like fairies, more magical' (PT12, main study).* PT12's contradictory opinions could possibly indicate that she wanted to see some realistic looking characters for younger children. Although being a valid comment and suggestion, realistic images can hardly support fantasy play. They could, however, be

used for the purpose of enhancing storytelling in the Rosebush toy and should be considered for that application in the future.

Some options in Hero/Avatar were criticised for a lack of flexibility that prevented the children from engaging in fantasy play. For example, pictures could not be flipped when children wanted to do so. The colouring in of a hero was quite difficult owing to the lack of a fine-tuning option. In addition, there was hardly any feedback on fantasy images like the flying feathers and snowflakes in the Flying Feathers toy that also aimed to support fantasy and creative play.

Figure 47. Heroes created by Tom

Enhanced Role-Play

The children used the Water toy as a means for setting up a scene for their play with tangible toys. For example, Tom used Water as the background for puppets. His story revolved around racoons, which lived by the river; therefore, although not designed specifically for Storytelling, Water created opportunities to create a realistic environment for play (Figure 48).

Figure 48. Water as a setting up scene for puppet play

Another example of children using the Water toy in an unexpected way was that of a girl who played the sound of rain with the lights dimmed in the playroom. She would also bring along traditional toys on the interactive table and either play or just sit quietly enjoying the atmosphere: *'[Water toy] does enhance as far as even creating the backdrop for other things... it is amazing... she even put the little lights in the back... it just set the stage... really awesome for that' (PT10, main study).*

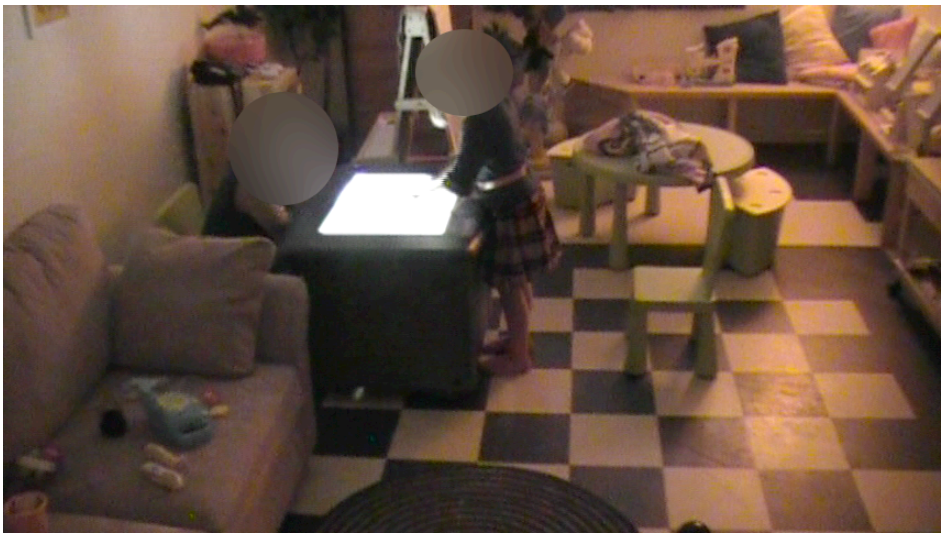

Figure 49. Dimmed lights for the play with rain

Limited Emotional Expression through Digital Characters

The therapists found that the Rosebush toy in Magic Land was occasionally used by children to express their emotions through characters. The picture below shows Tom's attempt to change the facial expression of a blobby character. While discovering how to erase the smile of the character, he was struggling to find out how to draw a new smile on the face.

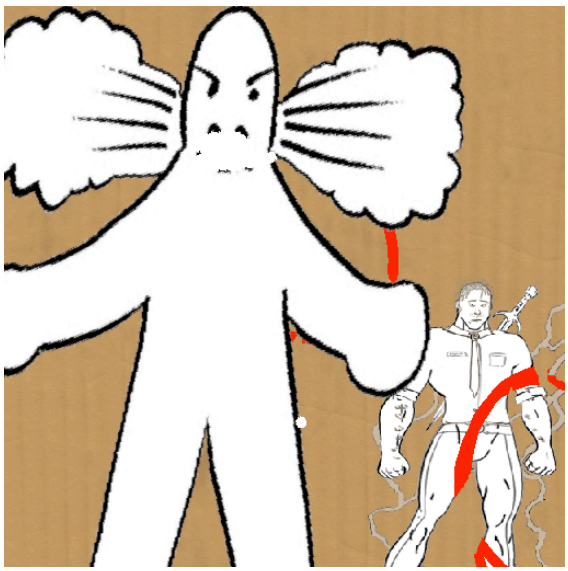

Figure 50. Tom's attempt to change the character's facial expression

Although Magic Land provided an opportunity to change blobby characters' facial expressions by means of the erasing and drawing-on options, the therapists commented that generally children hardly engaged in this type of play at all. This could be partially because they did not discover the availability of this option, and partially because the application did not include a fine enough colour tuning facility actually to draw on the characters' faces: *'...it's even hard with painting and stuff to even create... if there was a pencil maybe it would be easier' (PT12, main study).* Therefore, the trials suggest that Magic Land could potentially be used for emotional expression; however, they also highlight the importance of having precise and accurate drawing tools when designing such an application.

Relaxation and Peaceful Feelings

Surprisingly, although the Water toy was not designed to elicit any types of emotion from the child, therapists reported it to be *'very therapeutic' (PT5, mock trial)*, since it is a relaxing tool that has a calming effect on children: *'It's calming, relaxing… it slows the mind down...' (PT9, main study)*. The therapists reported that Water was one of children's favourite toys in Magic Land: *'the fact that it's moving and it's tactile' (PT5, mock trial); '... fascinating...' (PT2, mock trials)*. They also said that it encourages *'a peaceful exploration... and relaxation. You could do a lot of things with the screen that you couldn't do if you used real water' (PT2, mock trials).*

Experience of joy, fun and pleasure

In addition, Magic Land was reported to encourage the child's expression of positive feelings, owing to its being *'unique'* and *'more fun' (PT10, main study).* Generally, this was perceived as beneficial, but there was also a concern that the technology, becoming too much fun, interrupts the therapeutic process because it does not allow the child to work through painful experiences. This concern was based on the belief that therapy is not meant to be fun: *'Therapy is meant to help you grow... therapy can't be fun, it can't be enjoyable... I don't think it should be horrible, but for some people it is because they're working through really hard stuff...' (PT12, main study)*.

As shown earlier (see section 4.2.1), the design of Magic Land was based on the therapists' requirements that it should be kept *'welcoming and friendly' (PT1, design stage)* in order to support the development of a warm and friendly relationship and create a safe environment for the child to explore. It could possibly be that the absence of darker images in Magic Land made it more difficult for the children to work through their painful experiences. In other words, they may not have had enough tools in Magic Land to express their negative feelings and describe difficult life events. Thus, Magic Land may have supported the

expression of positive feelings such as fun and enjoyment more than the expression of negative emotions.

4.7.4 Recognising the gradual nature of the therapeutic process

Child's Right to Choose Toys

During the first iterative cycle, Magic Land included a fading in and out option to indicate the beginning and end of the session. However, it was said that if a child had difficulties starting and finishing off the play session, the fading in/out of Magic Land would take away the child's freedom to handle his or her difficult feelings. Therefore, this feature was taken off in the second iterative cycle at the request of the therapists, who believed that such a feature would interrupt the therapeutic process. Indeed, to support the gradual nature of the therapeutic process, children need to be able to do things at their own pace and in their own time. For example, as the videos show, the children spent approximately 10 to 15 minutes of the session on the tabletop before moving on to play with tangible toys. Younger children tended to play with the traditional toys more than with Magic Land, which could be possibly explained by their developmental need for sensory play.

Older children, on the contrary, spent more time in the Magic Land, stopping their play just to talk with the therapist with no other toys involved. The absence of time limits in Magic Land enabled children to follow their own inner guidance in choosing between play materials they thought would be the most appropriate for their self-expression. In addition, they could engage with these materials/toys for as long as they wanted to without any time limitations: *'if you want to spend more time on it and learn more about it [Magic Land] 's available. If not, that's fine too...' (PT10, main study)*

4.7.5 Unconditional acceptance of the child

Taking pressure off

In order to support the principle of *Unconditional Acceptance*, Magic Land was designed to be goal-free and thus, of winning/losing or levels of difficulty. The therapists reported that the design of Magic Land allowed the children to experiment freely without feeling afraid that they may lose a game. On the contrary, playing with Magic Land seemed to support the children's acceptance of themselves as they are, instead of evoking a desire for achievement and a struggle to do better. As the therapists put it, Magic Land took the pressure away and allowed for free play: *'I find it less pressure, and it's for them, because they don't need to complete a task or anything... it's just there and they can leave it and it [Magic Land] doesn't get upset [does not respond if the child stops playing]), and they come back and it's awesome...' (PT9, main study)*.

4.7.6 Setting necessary limits

Child's curiosity and misconduct

The therapists reported that they did not think that setting limits at the table would be an issue at all. Since it was only the Magic Land that the children were to be using, they were not given instructions on how to exit the menu and use the main screen of the computer: *'the only one [limit] would be: don't open the [main menu]... 'cos there's not much they can do... if they exit the programme' (PT10, main study).* Indeed, since the children were not given the instructions, they did not even know that it was possible to exit the designed application. This was planned in order to limit the child's use of the interactive tabletop to Magic Land only. The videos, however, showed that children could discover how to exit the Magic Land even without instructions. When Tom exited the application he asked his therapist: *'What's in here?'* PT11 replied: *'That's all that is here'*, double-tapping the icon to re-open Magic Land.

Although Tom never tried to exit the Magic Land after his therapist limited the use of the tabletop to the application only, another child, Ted, who was diagnosed with ADHD, would not follow his therapist's limit

setting as easily. Having discovered how to exit the Magic Land in the first 5 minutes of his interaction with the technology, the therapist had to say 3 times that only the Magic Land application could be used on the computer. The child would not respond but persistently exited Magic Land time after time and clicked on other icons on the main screen. In the end this resulted in files being deleted from the Hero application. Shortly after that, Ted discovered the key to the table, asking '*What is it for?*' PT11 had to set the limits regarding the use of the table once again.

Figure 51. Tom exiting the Magic Land

This incident demonstrates how intuitive children can be when it comes to technology. It also shows that it is more difficult for some children to follow the therapist's instructions than for others. It may be especially challenging for children who suffer from ADHD or misconduct problems. Therefore, some improvement needs to be made regarding the possibility of exiting the application. If there is no way to exit Magic Land to go to the main screen of the computer, there will be no chance of children deleting files or damaging the programme. It would also reduce the risk of children being disappointed if the Magic Land is damaged and not working.

4.7.7 Reflection of child's feelings

Therapy monitoring

The therapists reported that saving the child's work allowed for the tracking of the therapeutic process. Magic Land enabled comparisons

to be made between where the children started in the first session and how their creations changed during the therapy. Printing enabled the children to share with their families what they had done during their sessions with the therapist: *' and even to be able to take with them what they did that day may be really nice, so that they can take it home and share it with their parents or keep it with them - maybe like this… [it will be] a reminder of what they did and the kind of things they learnt about themselves' (PT9, main study)*.

Although the therapists reported a tracking option to be helpful, in practice it was found that hardly anyone actually saved the child's work and looked at the progression of the child's play. Moreover, there was not a single report of a child taking the printout home. This discrepancy between the therapists' thoughts and their actions could be explained in a number of ways. First, the weekly workload of a therapist at the centre where this study was carried out consisted of 35-40 hours. This suggests that the therapists might simply not have had enough time to look at the child's saved work. In addition, there was no printer installed in the play therapy room. Instead, each therapist had to do printouts in their office, which just added to the workload. Perhaps, if the instant printing had been available in the playroom, the therapists and children could have made better use of it.

Protecting privacy

Unlike printing, memory sticks for saving children's work were available to the therapists at all times. Interestingly, however, as the main study revealed, only one therapist used the memory stick consistently to save and print children's work. Others, by contrast, did not use the memory sticks allocated to each child, which meant that the children's work was saved onto the hard drive itself. This, in turn, occasionally caused breaks of confidentiality and privacy. Although they had been given training in the use of Magic Land and interactive tabletops, the therapists seemed not to realise what could and did in fact happen as a result of their decision not to use the memory sticks. They reported that

Magic Land supported the protection of the privacy of each child and of keeping their work safe.

4.8 Summary

In this chapter I have discussed how the design guidelines were formulated based on the existing NDPT literature and practitioners' views. I presented the complex process of the development of the application called Magic Land, its iterative design and the production of the final prototype in relation to the outlined design requirements. Having established the technical reliability and safety of the application for therapeutic use, Magic Land was tried out with primary school children in a real-world deployment. Using NDPT principles as the guidelines for the data collection and analysis, a number of sub-themes were identified in the participants' responses and the video data. Among these sub-themes are the following: *Motivation & Engagement; Promoting a sense of mastery and staying in control; Expression of fearful and angry feelings; Enhanced Creative Expression; Promotion of Relaxation & Peaceful Feelings and Encouragement of Experience of Joy, Fun and Pleasure,* to name but a few.

CHAPTER 5. DISCUSSION

'It is a happy talent to know how to play.'
~Ralph Waldo Emerson

5.1 Introduction

In this chapter the research presented in this thesis is drawn together in a discussion of the answers to the posed research questions. Since the first research question is directly related to design, subsection 5.1 covers the discussion of findings related to Design Guidelines, which may be of particular interest to those in the field of Human-Computer Interaction who design applications for use in the mental health arena. I draw on theories of child development, including those of Vygotsky (1978) and Piaget (1952), to explain why these particular design guidelines were outlined for the context of NDPT.

In subsection 5.2 the findings are discussed in relation to research question 2 and are concerned mainly with the Play Therapy field and the broader context in which the technology was used. It is discussed how the Magic Land software on a SMART interactive tabletop could support NDPT principles, and how its use contributes to the therapeutic process of children in play therapy. The psychoanalytic theories of Bowlby (1980), Erikson (1963) and Piaget (1952), socio-cultural theory of Vygotsky (1978), as well as NDPT literature (Rogers, 1951; Gil, 1994; Landreth, 1991; Carmichael, 2006; Ryan & Wilson, 2005; VanFleet et al., 2010), are used to explore the benefits of the technology for the therapeutic process in non-directive play therapy. Further, the implications of the findings for NDPT research and practice as well as future directions are discussed in this chapter.

5.2 Designing for Non-Directive Play Therapy

Research Question 1: 'How, if at all, could an application on an interactive tabletop be designed to suit the non-directive play therapy framework?'

As covered earlier in Chapter 2, several scholars (Carmichael, 2006; VanFleet et al., 2010) and practitioners (Ryan, 2009; PT9) are quite sceptical about the use of technology in NDPT. The main concern they express is the structured and absorbing nature of technology as well as its limited ability to encourage children's expression and creativity. In addition, they emphasise the unreliability of technology that can frustrate and disappoint a child, thus hindering the therapeutic process.

Since technology has undergone a rapid development resulting in new digital tools, the affordances of which differ from those of traditional computers, this research has raised the question of whether applications on interactive tabletops, a new generation of computers, could actually support rather than interfere with the NDPT process. In the process of designing the application called Magic Land, several design guidelines were outlined. The detailed process of formulating these design guidelines was covered in Chapter 4. This subsection discusses the findings in relation to the main guidelines, which designers will be required to follow in the future in order to develop the application to suit a NDPT context.

Based on the literature review and the therapists' reports, in order for the application to suit NDPT, its design has to be aligned with the NDPT principles outlined by Axline (1947). The detailed process of design and the theories of child development it is based upon were covered in much detail earlier in Chapter 4 (subsection 4.2.1). Since the current study is among the first to explore the possibility of the application of interactive tabletops in NDPT, there was no broader NDPT design framework to map the current findings upon. One thing, however, is certain: the design guidelines for NDPT are different from those guidelines used in directive therapies (Giusti et al., 2011) and educational applications (Dillenbourg & Traum, 2005; Kharuffa et al., 2010; Rick et al., 2011). Therefore, this section discusses the first research question concerning what is required to design for a non-directive play therapy

framework, and compares the NDPT design requirements for interactive tabletop applications with those in directive therapies as well as those in an educational context. Such elements as *friendliness/safety and freedom of expression; free play,* and *the balance between static images and interactive activities* are discussed. A discussion of the importance of the *protection of the child's privacy* and the *complex multilayered design* concludes this subsection.

5.2.1 Friendliness & Safety versus Freedom of Expression

The therapists' responses indicated that for the application to be able to suit the NDPT context, it is required to be warm and friendly as well as avoiding dark images, which was formulated as *DR1*. The findings indicate that the application is also required to support NDPT *Principle 4* of *Establishing the Feeling of Permissiveness for the Child to express Anything*, including those feelings that are difficult and negative as well as disturbing past and present events. This reveals a conflict in relation to the images and characters which are to be included in the application. On the one hand, the therapists' request for only *'healing and warm'* pictures is completely understandable in light of NDPT *Principle 1* of *Developing a Warm and Trusting Relationship* (Axline, 1947). Indeed, to establish such a relationship, the child needs to trust the therapist, which, in turn, requires the child to feel safe and welcome. On the other hand, as the findings from the real-world deployment stage showed, Magic Land did not provide enough options for a child to express his or her negative feelings (e.g., darker images and less friendly-looking characters), and thus *DR 4* was not fully implemented. The video data also suggested that Magic Land was used mainly for the expression of positive emotions, fun and relaxation.

Unfortunately, there are hardly any studies that explain how images and tools are chosen and selected for the applications in a therapeutic context. The studies previously conducted in the educational context (Dillenbourg & Traum, 2005; Kharrufa et al., 2010) did not focus on the pictures since the applications were designed for the development

of higher-order thinking skills based on the various pieces of text and logical tasks to perform. The research in the CBT context (Giusti et al., 2011) also focused on collaborative goal-oriented tasks and did not explore the emotional aspect of included pictures and images.

Perhaps, the research conducted by Hancock et al. (2010) and Bellinson (2005) is an exception that could shed some light on the current problem. When creating a digital sandtray (Hancock et al., 2010), all the existing toys and miniatures being used by the therapists were transformed into digital images. The study concludes that the digital images of the miniatures provided the therapists with enough projective material to understand the client's psyche. In a similar way, Bellinson (2005) reported that the electronic game Gameboy served the means by which projective material was expressed. Therefore, it is reasonable to assume that in these studies both negative and positive images of miniatures were used.

In light of this, it seems unreasonable to include only 'healing, welcoming and friendly' images, as the exclusion of the negative pictures automatically limits the full expression of ALL feelings and emotions that a child needs to express, and might negate the therapy by not allowing the therapist to understand the child in full. In addition, various symbols are needed for the process of assimilation and adaptation upon which symbolic and fantasy play are based (Piaget, 1952).

Children in therapy need to work through challenging unpleasant issues and may require darker negative images to express their feelings and experiences. Also, NDPT emphasises the need for a permissive environment in which a child is allowed to express ANYTHING (Axline, 1947), which means both bright and dark images are needed. These requirements for darker toys are already expressed in the set of traditional toolkit usually advised for a play therapy room (Landreth, 1991): e.g., acting out or aggressive-release toys (weapons, play guns, swords, knives, toy soldiers, military vehicles, aggressive puppets etc.)

Indeed, among these toys there are not only friendly dolls and bears but also threatening armed soldiers and aggressive dragons.

However, it is important to remember that while children are familiar with figures of soldiers, new ‘darker’ images on an interactive tabletop may have a very different effect owing to their unfamiliar appearance. Children are vulnerable, and what may not seem frightening for a teenager or an adult might give rise to more fearful emotions for a child. Therefore, although the inclusion of frightening and dark images and characters is necessary for full self-expression, the selection of these, however, has to be carefully made and they must be checked for safety with the therapists before they are introduced into the therapy with the child. Having consulted the therapists, it would possibly be a good idea to get the children involved in the design by asking for their opinions and feedback directly.

In this case, Vygotsky’s concept of scaffolding (1978) could prove useful: to support the child in facing and expressing fearful emotions and events, images of differing degrees of ‘darkness’’ could be introduced. For example, some children may feel the need for only slightly dark images of monsters, while others may prefer really frightening pictures of dungeons and basements. It seems reasonable to introduce a scale of how ‘dark’ and ‘scary’ children would like their images to be. By providing these options but leaving children the option of picking what is needed and when, designers may encourage and support them in exploring fearful events and emotions without imposing on or directing their play in any way. The application has to reflect both Vygotsky’s scaffolding and Piaget’s self-direction concepts but present them in a balanced way that is beneficial for the child.

5.2.2 Free Non-Directive Play versus Structured Goal-Oriented Activities

As the findings revealed, another design requirement outlined by the therapists and required by NDPT *Principle 6* is the creation of options

for free play without a structure or goals (*DR6*) within the designed application, if it is to suit the NDPT context.

It is evident that the requirement for free non-directive play is one of the main differences between design guidelines in the fields of education and directive therapy compared to the NDPT field. Indeed, as discussed earlier, in an educational context interactive tabletops are used for the exploration of collaboration on meaningful and challenging design tasks (Rick et al., 2011), the externalisation of the development of higher order thinking skills (Kharrufa et al., 2010) as well as problem solving (Dillenbourg & Traum, 2005). All the applications designed for these purposes would need structured activities and specific goals for the user to achieve. The usefulness of Vygotsky's theory for the design of the application in this context can hardly be overestimated. Its concepts not only guide the design to support collaboration, the externalisation of thinking and the development of higher order thinking skills, but also help us to understand how the learning outcomes improve during peer interaction through the medium of technology.

Similarly, within an approach such as Cognitive-Behavioural Therapy (CBT), which is directive in nature, application design follows an 'explore-listen-discuss' agenda with clear tasks based on social stories and specific problematic situations (Giusti et al., 2011). Once again, Vygotsky's concept of scaffolding, that is helping the learner achieve what he cannot do without help, is highly relevant to the design of applications within directive therapies.

The responses of the therapists in this study were in line with current NDPT literature (Landreth, 1995), and indicated that free play without an agenda is essential for NDPT. This means that the application will be quite different from applications designed for the purpose of practising finding solutions and exploring alternatives in the CBT and educational contexts. Therefore, the findings suggest that digital toys have to create opportunities for free play but not lead or impose a

structure on the child's choices. In other words, diversity and flexibility of tools and options within the application are a must if it is to suit an NDPT framework.

Although Vygotsky's theory may shed light on how the application is being used in NDPT, it has little to offer the design process itself. Indeed, since the aim of the application is to provide free, unstructured and non-goal oriented play activities, Vygotsky's idea of embedded challenging tasks is not appropriate for the NDPT context. For the application to suit NDPT, what are needed are opportunities to develop a trusting relationship development as well as for creativity and free expression. To this end, the findings indicated that Piaget's theories, emphasising symbolic play, as the means of child adaptation are highly useful for the design as they provide the necessary explanation of the importance of symbols and creative play for children within digital toys. Therefore, while both theories (of Vygotsky & Piaget) aid in our understanding of what applications on interactive tabletops can offer NDPT, it is Piaget's ideas which were the most helpful in the non-directive application design process of Magic Land, and they will probably also be useful for the further development of non-goal oriented digital toys.

5.2.3 Static Images versus Interactive Activities

In relation to the design requirements for free play discussed in the previous subsection, here I continue the discussion about how to provide an interesting and animated application while at the same time leaving it in the child's control and letting the child lead without introducing any prompts or initiations from the application and its characters (*DR 2&3*).

Previous applications design does not seem to have been challenged by the design requirement of creating unstructured free play with the child in the lead. Since it is one of the core NDPT principles (Axline, 1947), it was thought that this requirement could be met by providing the child with diverse static images and options that are fully

under his or her child's control (as explained in Chapter 4). In addition, based on the therapists' responses and NDPT *Principles 2 & 3*, any animation of the images or independent activity of the system was deliberately excluded. Interestingly, as the findings revealed, the therapists contradicted themselves on this issue during this study. First, they requested that the system be static and under the full control of the child. Later, during the design stage, however, some of them asked for 'new play opportunities' such as the *Water Environment* with fish and fireballs to be included, so that the child could play with otherwise inaccessible toys, although these options are highly animated and mobile in nature.

To resolve this conflict, it was decided that these options would be provided but that their interactive functions would be limited. For instance, water was made available for the child but it would not create waves until the child touched the screen; fireballs looked like a burning fire but they would not move across the screen until touched by the child etc. Nevertheless, as the findings indicate, the therapists thought that a more animated and interactive way of presenting these options would support fantasy play and creative expression and thus support the child's right to express anything (another core principle of NDPT). This suggests that while static images ensure that the children remain in full control of their play and that they take the lead in deciding what and how to play, interactive activities (such as blowing wind or raining clouds) could significantly support the child's expression.

This tension between the therapists' opinions on static images and interactive activities reflect the tension between the theories of Piaget and Vygotsky as applied in this research. Clearly, the needs for creativity and expression (e.g., through the means of fireballs, water etc.) were highlighted by both the therapists and the literature (Piaget, 1952; Landreth, 1991; Axline, 1947). However, in order to increase the number of opportunities for children to express themselves creatively, the therapists wanted to provide some imaginative features (e.g., snowing

clouds or blowing wind) that would be outside of the child's control, which is in opposition to the NDPT principle of *Letting the Child Lead* (Axline, 1947). The therapists' intention to direct what happens in the child's play reflects Vygotsky's concept of scaffolding: it seems that they wanted to help the children to express more by providing a supportive structure that would enable them to achieve a definite goal. This, however, becomes problematic, as by wanting to introduce ready-made scenarios the therapists seem to be claiming to know what needs to happen in a child's play.

One possible solution would be to provide children with options for static images to become interactive and then leave it to them to decide whether and how to choose these options. For example, by giving children the options of linking 'snowing', 'raining' or 'burning' with any of the images they choose gives them the opportunity to make a cloud or any other image snow, rain or burn depending on what their inner guidance directs them to do. In such a way, basic scaffolding is provided through making sure the necessary options are available. In addition, the child's freedom to lead and remain in control, which are the core NDPT principles, are fully supported by and in no way conflict with the concept of scaffolding. Therefore, in order to design for NDPT, one has to find the balance between the two aspects and the two schools of thought (Vygotsky & Piaget), to ensure that when interactive activities for fantasy play and creative expression are provided by animation, they remain fully within the power and under the control of the child.

Previous research (Mansor et al., 2009; Cassell & Ryokai, 2001) did not seem to have encountered any of the above problems. For example, the StoryMat application designed for storytelling through fantasy play included static images (horses and roads). Animating the pictures did not prove to be important since the application was more focused on creating stories through advanced narratives. Similar systems like Rosubud (Glos & Cassell, 1997), PETS (Druin et al., 1999) and Page Craft (Budd et al. 2007), were created to research storytelling and

imaginative play on interactive tabletops. Unfortunately, these studies contain hardly any information about the reasons behind the decision to include static images within these systems. In light of this, the findings of the current research establish the foundation for future system design and development within NDPT.

5.2.4 Play Recording versus Protection of Privacy

In this subsection I discuss the findings related to NDPT *Principle 8* (*Reflect the Child's feelings*), which resulted in *DR 8*: *Enable saving and printing of the child's work*.

The therapists' initial responses indicated equal amounts of interest and confusion regarding the technology's affordance of video recording the children's play on an interactive tabletop. On the one hand, the recorded play was reported to be useful for novice play therapists for training purposes. On the other hand, there were concerns about the usefulness of being able to watch the recorded child's play without being able to observe the child himself. Indeed, the therapists' responses are consistent with the NDPT literature (Axline, 1947; Landreth, 1991; VanFleet et.al, 2010) that prioritises the emotional connection between child and therapist over the analysis of the child's actions in the session. Unlike those studies in which audio recording was perceived to be beneficial for the child's creativity (Cassell & Ryokai, 2001), video and audio recording were not found to be of high value to NDPT in this research. In light of this, the decision not to introduce the recording option in the current version of Magic Land seems to be fully justified.

However, since the therapists did report some advantages of using the recording in the later stages of the 1st prototype improvement, it was proposed, instead, to use the options of saving and printing out static images. Therefore, this option, which was also aimed at ensuring the children's privacy through introducing memory sticks on which to save their work, seemed to be a good compromise. Indeed, respecting clients' privacy and confidentiality are fundamental requirements for maintaining

trust and respecting client autonomy (BACP Ethical Framework, 2013). It is especially important when working with vulnerable children (Plat Therapy UK, 2013).

Interestingly, as the results indicate, although the children saved their work, the therapists did not use memory sticks to keep the saved work private. Instead, the child's snapshots were saved on the interactive tabletop hardware, making them available for any therapist or any child to access, thus resulting in the breaking of confidentiality. This could have happened because the therapists were in too much of a hurry to remember to insert the memory stick at the beginning of the session. Since the therapists had been trained to follow the ethical framework in counselling services, it seems reasonable to suggest that perhaps they did not perceive saving the children's work on the hardware of the tabletop and, thus making it available to other children, as a breach of confidentiality.

Previous research that has used interactive tabletop recording affordances (Glos & Cassell, 1997; Druin et al., 1999; Budd et al., 2007) does not shed much light on this issue. In contrast to the NDPT context, in other areas the fact that the child's work is available to others may be actually be beneficial. For example, the StoryMat application (Cassell & Ryokai, 2001) not only allowed children to create a story but also made it possible for them to compare it to the stories previously recorded by other children to make their story ending more creative. Further, Digital Mysteries (Kharrufa et al., 2010) allow learners to work on tasks collaboratively, seeing each other's work and improving on their own.

However, given the importance of confidentiality in the ethical framework of counselling, when designing for the therapeutic context, including NDPT, the protection of the client's privacy and confidentiality is a must. The designers have to take every step to ensure that the child's work is saved only with the child's consent and in a digital space inaccessible to others (e.g., on a memory stick, as suggested and used in

the present study). Such questions as who is going to see the saved work, how long it is going to be kept in the digital space and how it can be accessed by the child and therapist have to be taken into serious consideration.

5.2.5 Complex Multilayered versus Linear Design

The previous subsections showed how the design requirements for NDPT differ from those in directive therapies as well as in the educational context. To design for NDPT, free play, the balance between static and interactive images, images that enable safe but full expression, as well as issues of privacy and confidentiality were emphasised as being essential. It is also crucial to balance the theories of Vygotsky (1978) and Piaget (1952), since when balanced, their concepts can be helpful in guiding the design processes. This subsection continues the discussion regarding how to design for NDPT by reflecting on the design requirements outlined in Chapter 4.

As explained earlier, the design requirements were formed based on each of the NDPT principles, and then refined according to the feedback obtained from the therapists and the children. Initially, a linear approach was adopted when formulating the design guidelines, with each of the principles being translated into a corresponding design requirement (Figure 52).

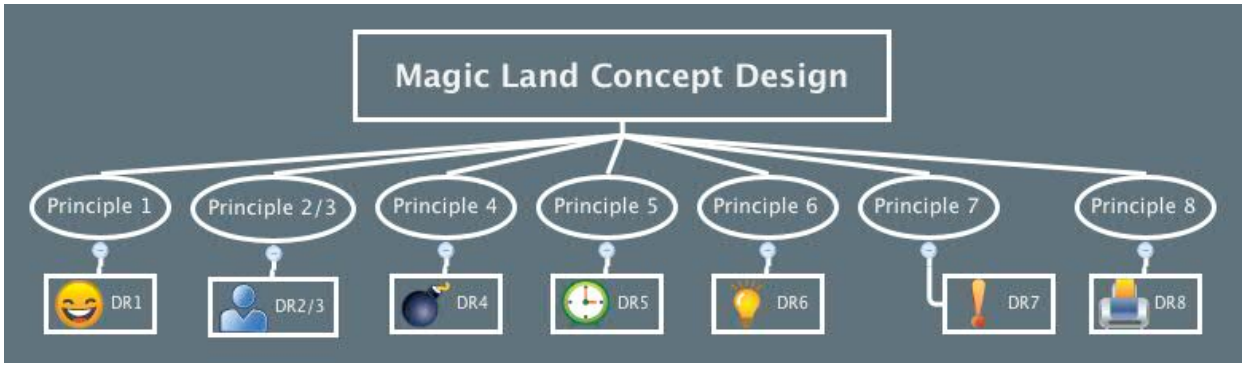

Figure 52. Magic Land concept design

For example, *Principle 1 - Developing a Warm & Friendly Relationship* - was translated into *DR1 - Create a user-friendly application*; *Principle 2/3* resulted in *DR 2/3* and so on. Practical use of the application, however, showed complex multilayered connections between NDPT principles and the outlined design requirements (Figure 53).

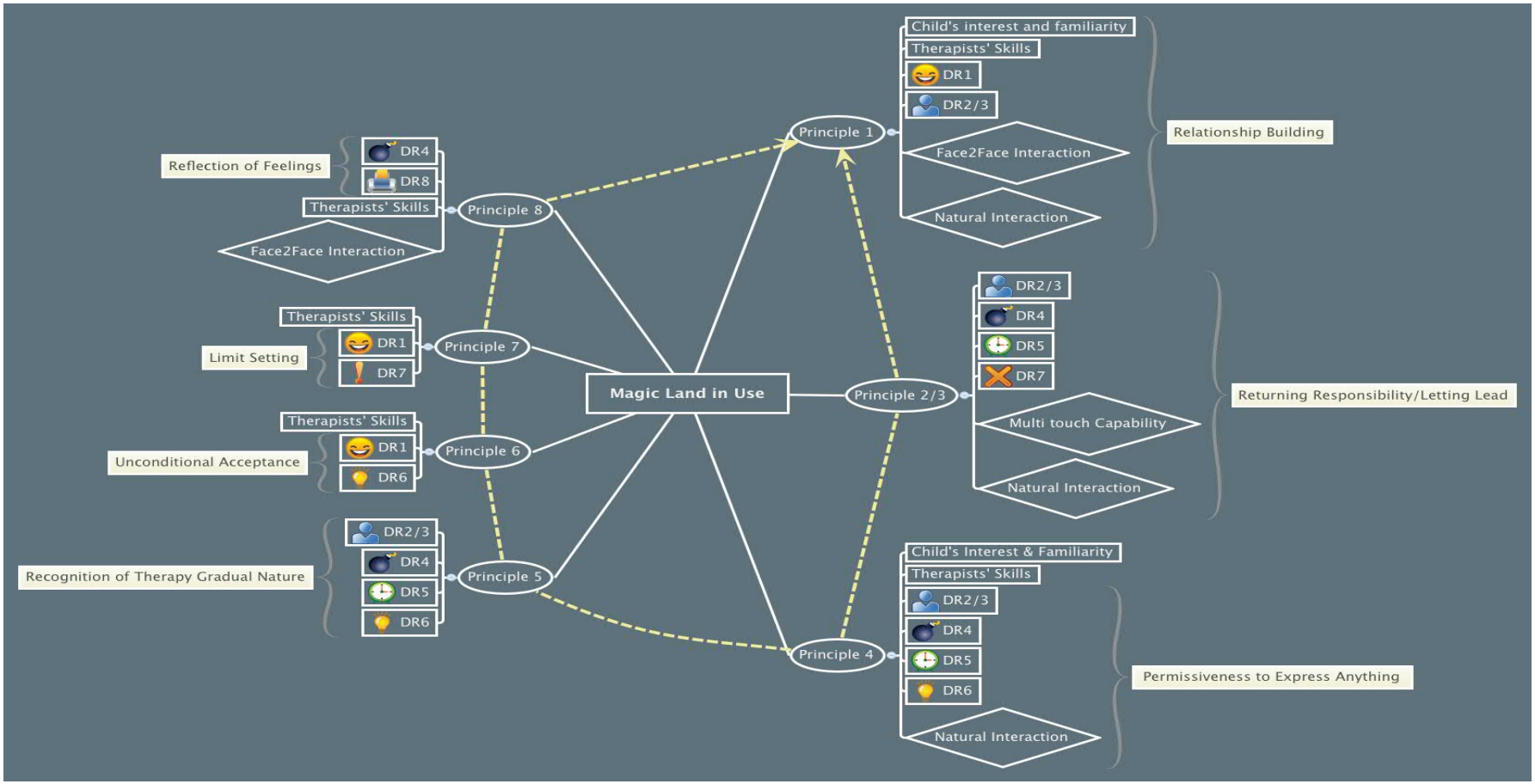

Figure 53. Magic Land in NDPT context.

For instance, in practice *Principle 1* was not only supported by *DR 1* but also by *DR 2/3*: *Give the child control and ensure simplicity of the application for the child's independent use; introduce no movements/prompts from the application unless initiated by the child; make contents of the application easily discoverable.*

In addition, such factors as the children's interest in and familiarity with the technology, the therapists' capacity to follow the child's play and the interactive tabletop affordances (Face2Face & Natural Interaction) played an essential role in supporting *Principle 1* (discussed in more detail in the next subsection). Further, *Principles 2/3* were found to be supported not only by *DR 2/3* but also by *DR 4, 5* and *7*, as well as by such hardware affordances as a Multi Touch Capability and Natural Interaction. As Figure 53 illustrates, this was found to be a general tendency, with each design requirement supporting more than just one NDPT principle. Unfortunately, apart from some research in the educational field (Kharrufa et al., 2010), there are hardly any other studies that demonstrate how design guidelines are formulated based on the underpinning theories and literature. This research study is therefore one of the first to explain the relation between NDPT theories and the design of a technological application – in this case, Magic Land.

The current findings suggest that the design for NDPT should not be oversimplified. Although the linear design served as a good starting point, future research should reflect the complex nature of NDPT and aim to map out further all the links and connections between NDPT principles and design guidelines. The next subsection discusses in more detail how the design requirements, the interactive tabletop affordances, the children's familiarity with the technology and the therapists' capacity to follow the digital play could support NDPT. The discussion continues by exploring the meaning of these findings for a broader play therapy field and healthy child development.

5.3 Supporting Non-Directive Play Therapy Principles

Research Question 2: How, if at all, could a novel digital toy like Magic Land on an interactive tabletop support non-directive play therapy?

5.3.1 A useful tool for a quick therapeutic alliance

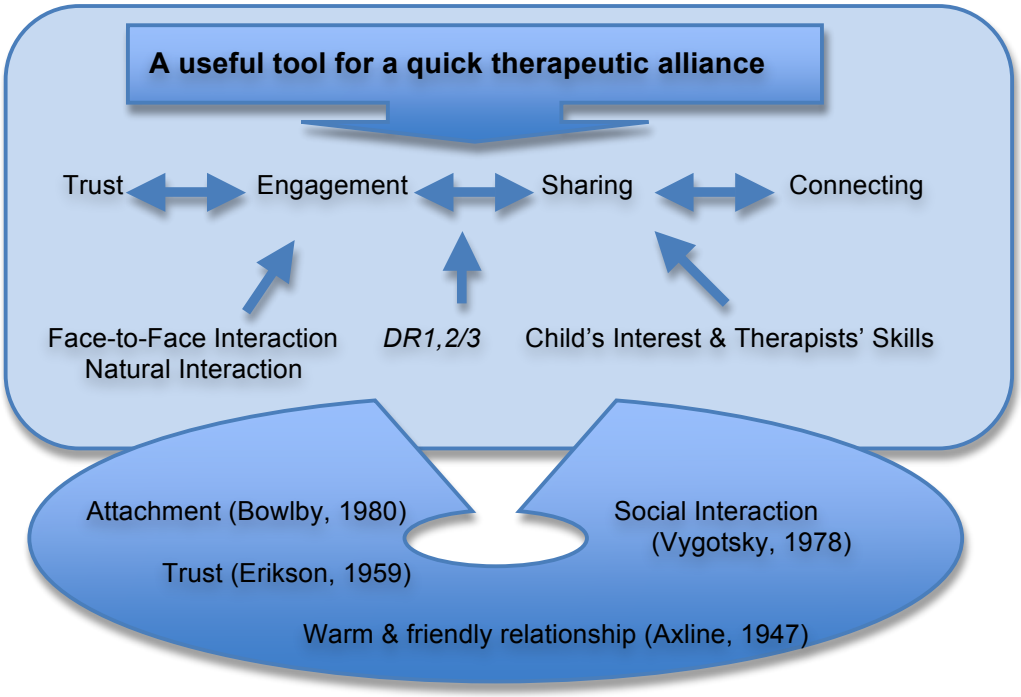

Figure 54. Magic Land as a tool for a quick therapeutic alliance

In contrast to those studies that have shown that technology restricts communication between child and therapist (Zelnick, 2005) as well as some literature that argues against the use of technology in NDPT (Carmichael, 2006; VanFleet et al., 2010), this piece of work has suggested an application called Magic Land on an interactive tabletop to be a useful tool for the quick development of the therapeutic alliance, which is the core principle of NDPT. These findings are similar to those of research conducted in the field of Human-Computer Interaction (Hatch et al., 2009), and also in CBT practice (Giusti et al., 2011), suggesting that tabletops promote peer and child/therapist collaboration by enabling face-

to-face interaction. In the context of NDPT, however, in this study it was found that it was not only the Face-to-Face hardware feature that contributed to user collaboration; it was also features such as Natural Interaction and the implemented *Design Requirements 1, 2 & 3*, in conjunction with the child's interest and the therapists' skills, that aided in the development of a warm and friendly child/therapist relationship.

The findings of the present study suggest that the fact that the medium of the technology helped in promoting trust and increasing the child's engagement in therapy, and provided opportunities for sharing feelings and allowing child/therapist connection around the tabletop, meant that a strong therapeutic alliance was built. Figure 54 presents a visual summary of the features of Magic Land, the affordances of the interactive tabletop and other factors that made this toy a tool for the quick development of a therapeutic alliance. This subsection discusses how these features and affordances contributed to the processes of creating trust, engagement, sharing and connecting between the child and therapist. I draw on the theories of Bowlby (1980), Erikson (1963), Vygotsky (1978) and Axline (1947) to map these findings against NDPT and child development theories.

Trust

The findings revealed that playing with Magic Land on the interactive tabletop promoted the child's trust in the therapist and the therapeutic process per se. As discussed earlier, many children who come for therapy have issues with trust; that is, they often do not trust adults owing to bad past experiences (Wilson & Ryan, 2005). The present study has demonstrated how the presence of Magic Land in the room served as an ice-breaker and took the pressure off, thus creating a friendly environment for the child to engage in therapy. Therefore, the introduction of the tabletop did not interrupt the therapeutic process, as feared by some scholars (Carmichael, 2006; VanFleet et al., 2010). On the contrary, as a result of the children's familiarity with and interest in technology, as well as the user-friendly design of the application (*DR 1*),

the Magic Land supported the therapists in creating a trusting environment (as recommended by Erikson, 1968; Axline, 1947; Landreth, 1991) that empowered the child to engage in the therapeutic process.

In addition, by promoting trust between therapist and child, the technology was shown to contribute to the child's feeling of safety, which is another basic, albeit crucial, therapeutic requirement in NDPT (Ryan & Wilson, 1995; Carmichael, 2006), based on the child's attachment needs (Bowlby, 1980). It is the goal of the therapist to provide a safe familiar environment that enables the child to feel as secure as possible in a strange environment. Perhaps, not surprisingly, during the design stages the therapists emphasised the need for the application to be safe and friendly (*DR1*). 'The familiar atmosphere tries to mimic the stable atmosphere of a normal child's home environment' (Ryan & Wilson, 1995, p. 31). Given the children's interest in technology and the safe design of Magic Land, perhaps it is not surprising that the child's feelings of safety and comfort became, as mentioned earlier, '*the ice-breaker'*, the basis for developing trust in the therapist and the therapeutic process. These findings match those of Hancock et al. (2010), which reveal the motivating nature of technology for children and young adults in the therapeutic context.

One more question needs to be asked, however. Although the children in the present study granted the therapist instant permission to enter their world in the presence of technology, how healthy is it to put complete trust in a strange person in a new environment? Indeed, as noted earlier in the Chapter 2, although trust is essential for a child's healthy development, one should not assume that a totally unquestioning attitude towards people and the environment is healthy (Wilson & Ryan, 2004). As children often gravitate to technology, they sometimes exhibited what could be interpreted as an unhealthy amount of trust and openness in the presence of a computerised toy. On the other hand, it may be argued that a child's trust can also be triggered by any traditional toy, which is of great interest to the child. Therefore, it is a matter of the

therapist being able to deal with both too much and too little trust on the part of the child, rather than avoiding toys that are likely to trigger these feelings. These feelings are usually expressed in a safe environment where the therapist can notice them and help the child to find the balance between trust and mistrust, which is in itself the objective of play therapy (Wilson & Ryan, 2005).

Engagement

The findings revealed that the presence of technology allowed for the establishing of a symmetrical relationship, keeping the child in control, which is crucial in NDPT (Landreth, 1991). For example, when the therapists were not quite sure how the technology worked, the easy Natural Interaction affordance and simple design (*DR 2/3*) meant that the children were able to master it much more quickly, which created a power shift between the therapist and the child, empowering the latter to engage in the therapeutic work. In this case the children performed the role of More Knowledgeable Other (Vygotsky, 1978), which, as reported by the therapists, had an empowering effect on the children, once again engaging them in therapeutic process. In addition, therapist feedback like '*Oh, that's how you do it' (PT11)* further strengthened the child's confidence. These findings are in line with those of Roffer (2006), showing that the development of a child's problem-solving skills can foster independence, self-esteem and autonomy.

These results give rise to the question of whether future applications should explicitly aim to encourage children to play the role of MKO, in order to create opportunities for empowering them and increasing their self-esteem. For example, this could be accomplished by creating play opportunities in which the child could choose to demonstrate his technological skills to the therapist. The therapist would need to reflect the child's ability to use the technology without necessarily praising him (as reflective comments rather than praise are used in NDPT).

Previous research (Brooks & Petersson, 2005; Calam et al., 2000) has suggested that computerised toys have beneficial effects on disabled children's motivation to engage in therapy. The findings of the present research extend our understanding of how technology can motivate children, and indicate that Magic Land on an interactive tabletop increased children's motivation to come for therapy and trust the therapist. The current study confirms the results of previous research, showing that owing to the playful aspect of computerised toys the latter can be useful for stimulating social exchange, by providing opportunities for the child to engage fully in the therapy and enjoy play (Dautenhahn & Werry, 2004). Also, the results indicate that the digital toy promoted the children's engagement in therapy by taking the focus off them and placing it on the Magic Land instead. These findings are among the first to indicate that digital toys may contribute to creating a relaxed atmosphere in a play therapy room, especially in the first few sessions.

Sharing & Connecting

Previously, interactive tabletops have been demonstrated to be a platform for promoting collaboration through encouraging verbal interaction between learners (Kharrufa, 2010). In other words, by sharing the space and working on activities together, children were shown to interact more and internalise the language, which aids in the development of reasoning skills and thus in the development of their higher cognition. The question of whether interactive tabletop affordances can enable collaboration and interaction between child and therapist that could help to create a warm and friendly relationship was raised earlier in this study. The findings suggest that indeed, child/therapist interaction was enabled by the Face-to-Face hardware affordance and that it contributed to the quick establishment of a therapeutic alliance, without excluding the therapist. The main difference between sharing around the tabletop in educational/more directive contexts and the NDPT context lies in the use of spoken language.

As the findings indicate, verbal interaction between the child and therapist on many occasions was replaced by what the majority of therapists called ‘a silent communication’ and ‘connecting to one’s feelings’. In order for both child and therapist to gain a deeper insight into the child’s feelings, silent free play in the presence of the therapist, who paid attention to the child’s actions, was found to be necessary. In other words, similar to beliefs in humanistic counselling (Rogers, 1951), silence in the presence of the therapist has been shown to be beneficial in an NDPT context, while in the educational field, when working on a goal-oriented challenging task the learners’ verbal interaction is a must.

These findings confirm Piaget’s ideas, suggesting that in the process of child development, an adult’s role should be that of a facilitator rather than that of an active leader who directs the child’s play/learning, as proposed by Vygotsky (1978) in the educational context. Indeed, Vygotsky’s thoughts on the essential role of language in interaction did not prove applicable to the NDPT context. However, his ideas on the importance of interaction, in this case non-verbal, are still relevant for understanding how interactive tabletops operate in NDPT. As the therapists reported, although silent, interaction through sharing feelings and connecting did take place. The interactive tabletop enabled sharing and connecting partly because of its size and the seating arrangements. The latter supported the therapist both in being present with the child’s creations on the computer screen and in maintaining face-to-face contact with the child.

It is difficult not to notice the similarity between the size of the screen on an interactive tabletop (22 ½ ×16 7/8) and a traditional sandtray (28 ½ × 19 ½), which is a form of expressive therapy and could also be an appropriate technique to use in NDPT, since this size is both psychologically and practically manageable. It is not too large to overwhelm the child but is a good size to be viewed and visually

examined in a single glance without having to move the eyes or head to observe all parts of the creation (Homeyer & Sweeney, 2011).

Despite the reports of the majority of the therapists that the Magic Land application facilitated sharing and the establishing of a connection between therapist and child, one therapist's feedback was supportive of the view of some scholars (Carmichael, 2006; VanFleet et al., 2010), who argue that technology interferes with the building of the therapeutic relationship. In this single case, the therapist felt excluded from the child's play and described the child's silence as '*defensive'* and *'avoidant'*. The videos, however, show that in this situation the therapist, instead of remaining attentive and keeping her gaze on the child, attempted to get involved in the child's play by asking questions and making suggestions.

This type of behaviour on the part of practitioners gives rise not only to the question posed by Smith (2012) of how practitioners should work with children's avoidance and defence mechanisms, but also to the question of the extent to which therapists should act in accordance with the basic non-directive therapy belief that children are capable of self-direction and inner guidance to achieve self growth and healing (Sallman, 2007; Landreth, 2002). Gil (1994) clearly states that no interpretations or directions in the form of questions should be posed by the non-directive play therapist. Therefore, it seems that on this occasion, when the therapist felt 'excluded' it was not owing to the presence of technology per se, but was rather a result of her own beliefs and her as yet undeveloped capacity to follow the child's play with the technology and reflect on the therapeutic process.

Therefore, the research has shown that the extent to which the use of technology in NDPT is beneficial greatly depends on the therapists' skills in using it, something which was also reported by the therapists themselves: *'it comes back to the person... who is using it with a client' (PT9, main study).* In contrast to the contemporary literature that explicitly states that technology has no place in NDPT owing to its

directive nature (Carmichael, 2006), the findings of the current study demonstrated that, in the hands of a skilled therapist, the Magic Land application on the interactive tabletop supported the quick development of the therapeutic alliance, which supports the core NDPT principle of warm and friendly relationship building.

5.3.2 The means of free expression and creativity

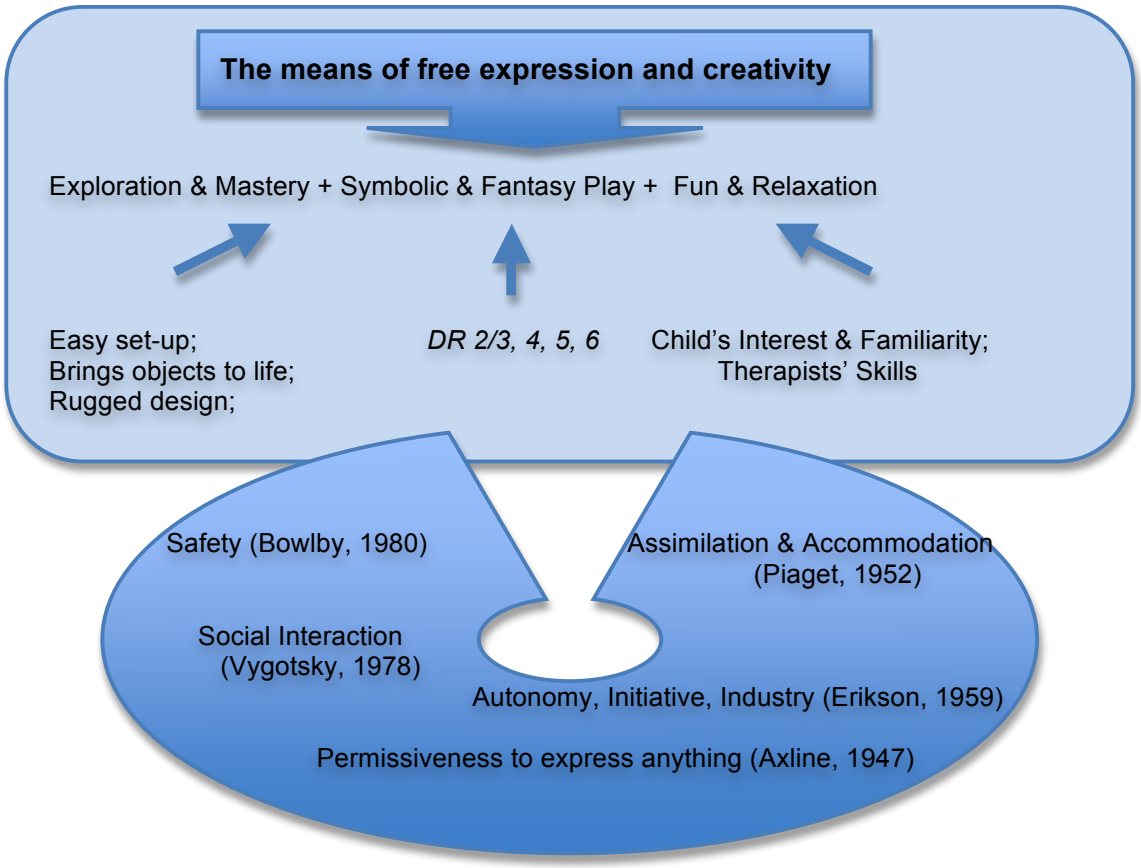

Figure 55. Magic Land as an expressive and creative tool

Another way in which Magic Land seemed to support NDPT principles was by becoming a tool of free expression and creativity, which are the elements of NDPT *Principle 4*: *Establishing a Feeling of Permissiveness to Express Anything* (Figure 55). The findings revealed that free expression and creativity were expressed in a number of ways: exploration and mastery; symbolic and fantasy play, and fun and relaxation. Affordances of the hardware such as its easy set-up, the fact

that it brings objects to life and its rugged design were shown to be useful for the establishing of an environment in which the child could express himself freely. In addition, the formulated and implemented *Design Requirements 2/3, 4, 5 & 6* of Magic Land (see Chapter 4) as well as the child's familiarity with and interest in the technology together with the therapists' capacity to follow the child's play in the presence of the digital toy were found to support NDPT *Principle 4*. This subsection discusses the significance of the findings of the present research for the wider play therapy field, in relation to the child development theories of Bowlby (1980), Piaget (1952), Vygotsky (1978), Erikson (1963) and Axline (1947).

Exploration & Mastery

The findings indicated that the Magic Land was under the full control of the child, giving him the freedom to explore and express himself in any way possible within the application. Unfortunately, there has been only a very small amount of research (Weir & Emanuel, 1976) that has explored the value of a child's being in control of a toy in either the educational or the therapeutic context, and therefore it is difficult to relate these findings to a wider field of research. However, the therapists' reports are in agreement with the literature (Wilson & Ryan, 2005; Erikson, 1968) that states that giving the child enough freedom and the opportunity to take the initiative contributes to the child's ability to make age-appropriate decisions. In this regard, it was demonstrated that the Magic Land digital toy gave the children enough freedom to encourage them to make their own independent choices and decisions.

Unlike the fears of some scholars (Carmichael, 2006; VanFleet et al., 2010) that the unpredictable and unreliable nature of technology means it can be frustrating for child, the therapists reported that the rugged design of the hardware made it possible for the children in this study to use the interactive tabletop without being afraid of breaking it. Magic Land was explicitly developed to be simple enough for the child's independent use (*Design Requirements 2/3*). This, together with such

hardware affordances as its easy set-up and convenient seating arrangements, were proven to help the child remain in control and master the Magic Land. In other words, the simple straightforward use of the tabletop without a mouse but through direct hand touch, as well as the comfortable face-to-face seating arrangements that allowed both the therapist and child to access the tabletop screen, helped the child to master the digital toy quickly, which meant he could then express his feelings and experiences through this new play medium.

As the therapists stated, being in full control of toys which in real life would be dangerous to play with, such as fireballs and water, resulted in fostering the child's autonomy and self-esteem, which is in line with the results of the study conducted by Roffer (2006). The present research findings further support Eric Ericson's theory that free play which is under the full control of the child is important because it does not impose any demands or expectations on the child, and thus helps the child move away from feelings of guilt towards feeling he can take the initiative more: *'I think he [the child] doesn't feel like he has a lot of mastery over a lot of things [in his life] and he gets to make a lot of choices [in the Magic Land] and... he's leading, he gets to be in control... which is really helpful for him' (PT9, main study).*

Interestingly, the results indicated that on several occasions the therapists seemed not follow the non-directive principles but take an active role, asking the children questions and suggesting how to play. It did not seem, however, that the reason for such behaviour was related to the presence of the technology in the room. On the contrary, those therapists were similarly more directive when the child played with other, traditional toys. What did happen, however, was that the successfully implemented *Design Requirements 2/3 & 4* allowed the children to remain in control of their free play even when the therapists attempted to lead their play. It is striking that Magic Land actually supported the non-directive nature of therapy even when the therapists became directive, while some NDPT literature (Carmichael, 2006; VanFleet et al., 2010)

argues that technology should be excluded from this type of therapy owing to its directive nature. These findings suggest that the first computerised toy - Magic Land - could support the NDPT principle of *Letting the Child Lead* even when the therapists themselves did not follow this basic yet crucial therapeutic requirement.

Despite the children's reports that the Magic Land was simple enough to be used independently to promote exploration and a sense of mastery, PT11, 10 and 12 reported that they had to show the children how to use the application. The therapists' intention to direct the children during the initial exploration of Magic Land could be explained in several ways. First, PT11 explicitly stated that he was afraid that the technology might not work in his hands and that he really needed to know it well himself before using it with children. His desire to teach the child how to use the Magic Land is consistent with Berlin's (1986) suggestion that therapists' own needs to feel competent and powerful may override their concern for the child's needs in the game.

Secondly, the fact that T10 and 12 took the initiative to show the children all the features of the Magic Land in the first few sessions indicated that they were prioritising their own needs over those of the children, which is in direct opposition to NDPT principles (Axline, 1947). The therapists' responses that the novelty of the technology does not allow the children to make full use of it are questionable, since these therapists did not allow the children enough time to explore it properly. As mentioned earlier, it is important that children are able to discover and make progress on their own through the Initiative versus Guilt process (Erikson, 1968). In this study it was not the novelty of Magic Land that prevented some of the children from doing this; rather it was the therapists' impatience or desire to support the child.

If this situation was caused by their impatience, it is an indication that the therapists' own needs had overridden the core NDPT principle of *Recognising the Gradual Nature of the Therapeutic Process* (Axline,

1947) and imposed their own pace on the child's play. If the cause was rooted in the therapists' desire to help, this shows that they had adopted the role of MKO, thus becoming active demonstrators (Vygotsky, 1978) rather than just facilitators (Piaget, 1952), and hence undermining the child's capacity for inner direction. Once again the findings reflect the tension between Vygotsky's concept of scaffolding used for the development of applications in a more directive/educational context and Piaget's idea of the child's ability for self-direction, necessary for the applications in NDPT. It is evident that in order to empower the child, it is not only necessary for the system to allow the children to follow their inner guidance but also, the therapists themselves need to follow the NDPT principles of letting the child lead without imposing their own ideas and pace on the child's play.

In addition, the therapists' responses support the views expressed in the literature (Sallman, 2007) that mastery through play (in this case, with the Magic Land) contributes to the development of a child's sense of power and mastery of his environment. The findings are also in agreement with Landreth (2002), who demonstrated that mastery play was particularly important for children who live chaotic or disrupted lives (as reported in this research by PT9). Thus, the findings show that Magic Land gives the child the opportunity to experience feeling in control, one of the core objectives of NDPT (Landreth, 2005).

Symbolic & Fantasy Play

The findings of the current study also demonstrated that the Magic Land application on an interactive tabletop encouraged children's symbolic and fantasy play, supporting the NDPT principle of *Establishing the Permissiveness to Express Anything* (Axline, 1947). The results revealed that fantasy play in the Magic Land helped the children to express their feelings, and to experience feelings of power and control over their environment. These results are in line with the ideas of Schaefer (1993), who outlined the beneficial features of fantasy play: giving children opportunities to learn about themselves and experience a

sense of power and control over their world. Therefore, the Magic Land digital toy has been shown to be as useful as any other traditional tool in the play-room in supporting the NDPT process in this respect.

In light of this, the results of the present study challenge the previous criticism of computer games which claimed that computers offer an overly structured non-symbolic type of play that does not allow unconscious feelings and experiences to be communicated (Bellinson, 2005). Unlike traditional computer games, Magic Land was found to allow for the creativity and symbolic play necessary for the processes of assimilation and accommodation in NDPT. Further, the use of Magic Land was reported to benefit therapy by creating increased symbolic possibilities (digital drawing, finger paint, snowflakes, rain etc.) and by expanding play therapy possibilities in general (i.e., as a new medium of expression); this finding confirms those of previous studies conducted in the field of Human-Computer Interaction (Olsen-Rando, 1994; Gardner, 1993; Zelnick, 2005).

The tabletop affordances of bringing objects to life by using various high quality pictures and the easy set-up that enabled children to manipulate these pictures on the horizontal display of the tabletop without difficulty were reported to enhance the children's creative play, thus providing new means of self-expression. In addition, since the program was explicitly developed to be simple enough for a child to use independently (*Design Requirements 2/3*), it helped the child to stay in control of Magic Land, experience a sense of power and to express creativity (covered in detail in the previous subsection). These findings are supportive of Cao et al. (2010) who showed how the implementation of the requirement of simplicity in the TellTable application promoted children's creativity.

Perhaps not surprisingly, the children in the current research used a variety of pictures and drawing tools to create their own snapshots or stories to work through their past experiences of deep emotions and

feelings. This method of using pictures and drawing tools is similar to a method used in previous studies which explored the benefits of blogging and webpage creation (Rubin, 2007; Riviere, 2008). The present findings thus reinforce the groundwork produced by previous research by demonstrating how children use digital tools to work through painful and traumatic events and to experiment with new identities. For instance, in the main study Rick created images of how he felt in different situations with his sister and matched those pictures to his emotions.

These findings suggest that symbolic play with Magic Land allowed the child to externalise past experiences through Magic Land's play activities and language. It can be suggested that during this process of using imagery and speech together, the cognitive and the affective components of schemas were integrated into the children's mental structures at their current developmental level, which is a necessary stage in NDPT (Wilson & Ryan, 2005). In other words, we can speculate that during play therapy with the Magic Land these images were incorporated into the children's play, resulting in emotional insight into their troubling experiences, which may have altered their personal affective schemas. Absent from the present study but usually used at the end of a therapeutic course, the Strengths and Difficulties Questionnaire (SDQ) could help future research to shed more light on this issue, since it could help determine the changes in a child's well-being and mental health after a course of therapeutic sessions.

In addition to images, the children used sounds to express their feelings and attitudes towards people in their lives. Interestingly, unlike those cases where various types of feedback (sounds, vibrations, etc.) were introduced to solve the problem of the technology limiting the child's sensory experiences (Roffer, 2006), in this study the children used the sounds available in Magic Land to enhance the creative expression of their feelings and emotions. The therapists' feedback demonstrated that play in the Magic Land on an interactive tabletop offered a stimulating environment for both the intellectual and emotional creativity that are

necessary for the therapeutic process (as argued by Newson & Newson, 1979), so that children can re-integrate their past experiences and re-work schemas.

Interestingly, although previous studies have shown that interactive tabletops were widely used by children for storytelling (Mansor et al., 2009; Cassell & Ryokai, 2001), the majority of children in the present study created snapshots rather than composed stories on the tabletop. The therapists' responses suggest that this was probably owing to the lack of structure provided in the Magic Land necessary for storytelling. Indeed, the focus on the implementation of Piaget's idea of self-direction in the design of Magic Land resulted in a shortage of structured options, which the therapists claimed to be necessary for creating a story.

Vygotsky's concept of scaffolding seems to be quite useful in this case: as the findings revealed, children may need a step-by-step structure to encourage them to use digital pictures and characters for storytelling. Once again, this reflects a tension between two theories, giving rise to the question of how to provide the structure necessary to facilitate storytelling but at the same time give the child the freedom to lead his own play. As suggested by a program developer Gavin Wood (Wood, 2011), one possible solution could be to introduce a digital book with clearly defined pages to help the child organise his story. In other words, minimum direction combined with a simple structure may succeed in balancing the concepts of Piaget and Vygotsky, which in turn would result in the improvement of the digital storytelling. This could become the next step in future research.

Unlike the above-mentioned studies where children used digital images for storytelling (Mansor et al., 2009; Cassell & Ryokai, 2001), the children in this study used Magic Land to enhance their stories expressed with their bodies in role-play. This new way of using the technology (mainly for setting the scene for the story) supports Ryan's (2009) opinion

that in the NDPT context the logical processing of traumatic experiences is not enough; children need to become emotionally involved in play and express their troubling feelings by moving their whole body, and using their voice and gestures. Indeed, this explains why the young children in the present study did not create many stories with pictures or express their emotions through the digital characters. Instead they used features of Magic Land such as sound, light and natural scenes (e.g., a water pond and rain) to set the scene for the role-play of their story. These findings in conflict with those of Roffer (2006), whose research showed that children's movement was limited to mere hand-eye movements when they played with computerised toys.

On the contrary, Magic Land was demonstrated to engage children in a role-play, integrating the use of technology, their bodies, their voices, and even traditional toys. This seems to be a clear answer to some scholars' fears (Carmichael, 2006; VanFleet et al., 2010) that digital tools can be totally absorbing for a child and take over all the other play materials in the play room; the findings of this research showed that children tended to integrate various play media depending on their needs and did not disregard one type of toy to the detriment of another.

In addition, the findings confirm the fact that younger children do need creative modes of expression since their language lags behind the development of their mental imagery (Wilson & Ryan, 2005). In other words, the study has shown that owing to the level of young children's development, it is easier for them to role-play their stories than to think through a scenario and display it on a digital screen (as the older children did). These two factors (i) the need for emotional involvement and expression with the whole body as well as (ii) the level of language development most probably influenced the children's use of Magic Land in this study, and they explain the unexpected way in which the children used the technology for storytelling.

Another factor that could explain why younger children incorporated digital storytelling into a role-play is their developmental need for sensory experience (Erikson, 1968). Indeed, taking tangible puppets to digital Water and Fire applications demonstrated the children's need not only to process their stories visually, but also to have tangible experience of their play. It is logical to conclude that digital storytelling and emotional expression through digital characters are more suitable for older children and teenagers, since their cognitive and verbal abilities are sufficiently developed to enable them to benefit from this type of digital play. This does not mean, however, that young children cannot benefit from playing with the digital tool. It means that no single mode of play can fully satisfy a child's needs to express anything (as required by NDPT *Principle 4*). Thus, Magic Land's capacity to expand the children's opportunities for expression (including fantasy and symbolic play and creative storytelling) supports a NDPT principle: *Establishing a Feeling of Permissive to Express Anything*.

Fun & Relaxation

In the previous subsections I discussed findings that demonstrate that Magic Land on an interactive tabletop supported such NDPT principle as *Establishing a Feeling of Permissiveness to Express Anything* by providing children with opportunities for exploration, mastery, and symbolic and fantasy play. This subsection continues the discussion, showing how Magic Land also supported the NDPT principles of establishing a relaxed atmosphere and expanding the children's opportunities for enjoyment and joyful play.

Unlike robots developed for emotionally and mentally handicapped children to provide opportunities for the latter to engage in and enjoy play to the full (Dautenhahn & Werry, 2004), the Magic Land design was not specifically focused on promoting joy and pleasure. It was found, however, that the children expressed many positive emotions while playing with the Magic Land. Firstly, as speculated in Chapter 4, this could have been owing to the shortage of 'dark and scary' images

and the options made available within the application at the therapists' initial request. Secondly, it could be explained by the children's interest and joy in using technology in general. As the videos revealed, playing with water, fire, rain and fish triggered the children's most playful behaviour and expressions of joy.

Interestingly, although joy and pleasure are outlined as the therapeutic factors of play (Schaefer, 1993), there are hardly any studies that have explored the value of fun and joy in a therapeutic context. Moreover, among the categories of toys recommended for NDPT (Landreth, 1991), materials that specifically promote children's fun play are absent. Instead, the focus is placed on real life, acting-out, creative expression and emotional release, as well as make-believe fantasy toys (Kottman, 2001). This raises the question of why scholars and practitioners in the field do not pay as much attention to play opportunities that enable pleasure and joy as to those materials that encourage the expression of disturbing feelings and experiences in the NDPT room. One possible answer could be found in PT12's response given in the main study. According to her belief, therapy cannot be pleasant: '*Therapy is meant to help you grow... therapy can't be fun, it can't be enjoyable...*' *(PT12).*

I would seriously question this idea, however. As Wilson and Ryan (2005) put it, non-directive play therapy may help children not only work through emotional difficulties, but can also provide a context for free, non-goal oriented play as a form of relief from the organised and demanding tasks in a child's everyday life. Free joyful play is likely to help children relax and feel safe so that they can connect to their troubling feelings when they are ready. Also, as discussed in Chapter 2, joy and satisfaction are necessary for a child's healthy emotional development (Erikson, 1968). As my own practice shows, the child who has feelings of inferiority is more likely to engage in therapy when a play activity/toy is fun. Moreover, constant 'hard' therapeutic work on behalf of the child is likely to overwhelm the latter.

In addition, PT12's assumption regarding what feelings the child should be expressing in the session is in direct conflict with NDPT principles. In denying the child opportunities of expressing of joy, the therapist is taking a directive position, assuming the role of a MKO (Vygotsky, 1978) and taking the lead into her own hands. In order for children to be able to lead and reclaim the role of MKO, it seems reasonable to make those toys that bring fun available to children so that they can balance what and how to express, depending on their inner guidance and needs.

Further, as discussed in Chapter 2, for healthy emotional and social development, overstimulation, unrealistic expectations and failure to praise may trigger children's over-dependency on recognition by others to the detriment of their inner sense of enjoyment. The absence of inner satisfaction in work may further lead to the child prioritising social over individual needs, resulting in the distortion of personally satisfying skills and activities losing their individual basis for satisfaction (Erikson, 1968). Thus, non-goal oriented activities/toys that help the child experience joy and pleasure and reclaim the feeling of inner satisfaction of play just for the sake of joy have clear benefits for the child's well-being in NDPT.

Therefore, giving children a choice and a variety of safe toys can help them relax and resolve feelings of inadequacy and inferiority. The Magic Land on an interactive tabletop has helped children to express joy and pleasure with calming and relaxing effects. It did not stop the children from expressing their difficult troubling experiences, nor did it completely absorb them in computerised goal-oriented non-creative play, as feared by PT2 and PT12 and some scholars (Carmichael, 2006; VanFleet et al., 2010).

5.3.3 Non-goal oriented toy that supports the gradual nature of therapy

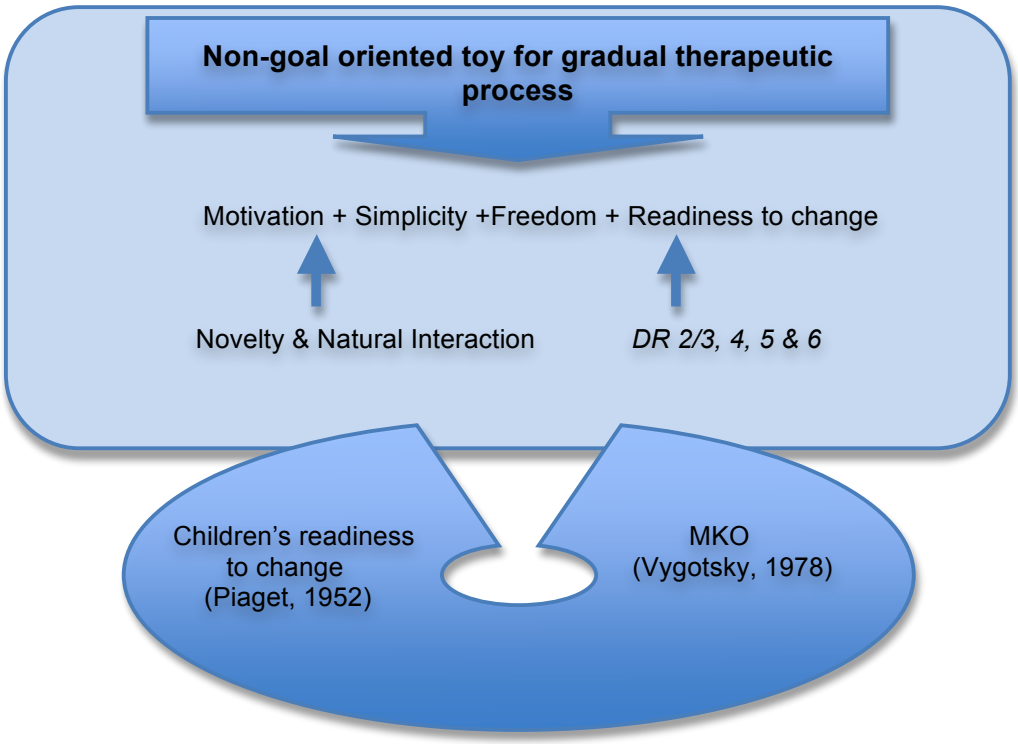

Figure 56. Magic Land as a non-goal oriented toy for gradual therapeutic process

In the previous subsections I discussed how the Magic Land application on an interactive tabletop supported the NDPT principles of developing a *Warm and Friendly Relationship (Principle 1)* and *Establishing a Feeling of Permissiveness to Express Anything (Principle 4)*. In this subsection the discussion continues by focusing on how Magic Land was shown to support NDPT *Principles 5 and 6*: *Recognising the Gradual Nature of the Therapeutic Process and Accepting the Child Unconditionally*. The tabletop affordances (Novelty and Natural Interaction), together with *DR 5 and 6* (*impose no time limits and create play with no winners/losers, no tasks or levels of difficulty; keep play activities free and unstructured*), Magic Land has been shown to be a

non-goal oriented toy that supports the gradual nature of therapy (Figure 56).

As discussed earlier in Chapter 4, the research revealed that Magic Land allowed children to follow their inner guidance even when the therapists did not follow the principle of *Letting the Child Lead* and adopted a more directive approach instead. As the result, the children had a chance to develop a sense of mastery and express feelings freely according to their needs, and not according to the therapists' suggestions.

The principle of *Letting the Child Lead* is closely connected with another one: *Recognising the Gradual Nature of the Therapeutic Process* (Axline, 1947). Indeed, for the child to be able to progress at his own pace, therapists need to ensure that he stays in the lead and that they do not hurry him by any means (see Chapter 2). The interview results indicated that Magic Land not only helped the children remain in the lead of their play, but that it also encouraged the children to be ready to change' or 'promoted a readiness to change in the children. As the findings suggested, the toy, owing to its novel and easy features, promoted the child's motivation to engage in therapy (similar to the research by Brooks and Peterson, 2005).

Further, Magic Land's simple design (*DR 2/3*) allowed for free, non-goal oriented play (*DR 5 & 6*), creating opportunities for a child to express himself freely (*DR 4*) at his own pace (*DR 5*). These elements: motivation, engagement and the capability that children demonstrated when using the Magic Land, are the basic factors that make a client in therapy ready for therapeutic change (Warda et al., 2003). It is established that the higher levels of readiness to change are linked to better psychological functioning (Clarke, 2011), and the best responses to treatments, regardless of modality (Lewis et al., 2009). Therefore, one can speculate that the use of Magic Land can help to improve children's mental health and well-being as the toy is likely to promote high levels of

motivation and engagement. Future research can explore this further by obtaining more data from children and therapists on this issue.

The findings of the current study are consistent with those of research in the educational field (Dillenbourg & Traum, 2005; Kharrufa et al., 2010), showing that interactive tabletops create opportunities for children to assume the role of a MKO during an activity performed on it. While in education they allow children to learn from each other during a learning exercise and thus improve learning outcomes (Kharrufa et al., 2010), in NDPT the child gets an opportunity to experience a sense of mastery, to practise staying in the lead and thus resisting outer influences (e.g., therapists' directive requests).

It is quite interesting how the Magic Land design and the interactive tabletop itself enabled the children to stay in the role of MKO without any direction given by the technology. Even more interesting is the fact that retaining the role of MKO, the concept developed by Vygotsky (1978), aided in the process of the children gradually getting ready for therapeutic change at their own pace. The idea of readiness for development is a central idea in Piaget's theory (see Chapter 2), which means that these ideas of Vygotsky (1978) and Piaget (1952) are closely linked with each other in the NDPT context. The current research demonstrates that two opposing schools of thought can actually be used together and be beneficial for the child in therapy when applied to the design of the digital toys in a balanced way.

Unlike therapeutic programmes developed to help children achieve goals (Riviere, 2008), Magic Land has been shown to be among the first computerised toys that give children the feeling of being accepted just as they are owing to the absence of goals, winners/losers, or tasks/levels of difficulty within the Magic Land. Unlike previously developed digital tools (da Costa et al., 2008; Brinkman et al., 2010), the Magic Land was found to support the principle of *Recognising the Gradual Nature of the Therapeutic Process* and also that of accepting the

child unconditionally. These results are quite astonishing in light of the existing criticism of computers in NDPT (Carmichael, 2006; VanFleet et al., 2010) and challenge the entire perspective on the possibilities of using computerised toys in NDPT.

5.3.4 A potentially supportive tool for therapy monitoring

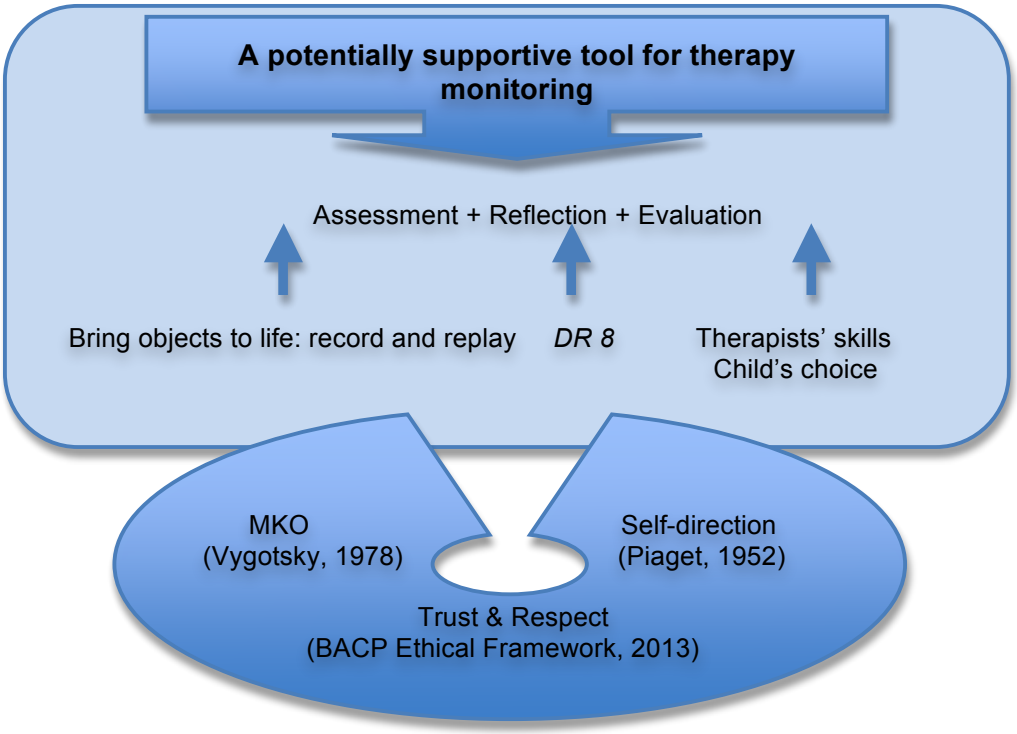

Figure 57. A potentially supportive tool for therapy monitoring

I discussed earlier the findings related to NDPT *Principle 8* (*Reflect the Child's Feelings*), which resulted in *DR 8*: *Enable saving and printing of the child's work* (subsection 4.2.1). The focus of the discussion was on *DR 8* and its implication for future system designs within NDPT. I now expand this discussion, concentrating on relating the findings to the child development theories of Vygotsky (1978) and Piaget (1952).

Unlike previous studies (Stillman et al., 1968; Roffer, 2006) that demonstrated the beneficial effects of computerised assessments, the present research uncovered a confused attitude and an unwillingness to use computerised assessments and evaluations on the part of the

therapists. Although the therapists argued that NDPT does not 'favour' assessments, in practice paper assessments are being widely used with children, parents and teachers. For example, Place2Be, the UK child charity organisation that delivers counselling services in primary schools, uses SDQ questionnaires for the initial assessment. This is also the case in the Canadian therapy centre in which the main study took place: therapists are to use SDQs to evaluate the state of the child in the first session. Moreover, play therapists, who are members of the Canadian Association for Child and Psychotherapy (CACPT), recommend conducting the initial assessment with children even when adopting a non-directive approach to therapy (Munns, 2011). The therapists' responses did not contain any clues that might shed light on why they thought that assessment, including computerised assessment, is of little value in NDPT.

Indeed, the therapists did not oppose the idea that a computerised assessment could save time and help organise the data more easily. It could of course be speculated that the therapists perceived having an electronic database of assessments, which they thought may not be well enough protected on the computer, as a threat. They might also fear that this, in turn, could increase the possibilities of unauthorised access and a breach of confidentiality, a crucial factor in therapy (BACP Ethical Framework, 2013). However, even this speculation does not seem valid in light of the fact that the therapists argued against ANY type of assessment, even traditional paper questionnaires.

Another possible explanation of why the therapists did not want to use assessments in their work could be that assessments are directive in nature. During this process, the child is not in the position of MKO; on the contrary, he fully follows the therapist's lead, who is determining 'what is wrong' with the child. Therefore, the therapists' inability to follow such NDPT principles as *Accepting the Child Unconditionally and Letting him Lead* (Axline, 1947) in the environment of assessment could have caused them not to use assessments at all. If this is the case, a computerised toy

could be a solution to this problem. Since Magic Land has been shown to support children in leading their play and expressing emotions freely without any goals or demands, it could be adjusted to suit the needs of assessment, keeping the child in the role of MKO and turning Magic Land into a creative form of non-directive assessment.

A different situation was observed with the therapists' responses on the benefit of recording the child's play: the therapists reported that they were interested in the idea but unsure of its benefits for NDPT. The main argument against using recording in NDPT was the importance of the therapist's emotional connection to the child and having the opportunity to reflect on the child's body language, which the digital recording on the tabletop would not be able to capture.

Interestingly, the therapists were considering the benefits of recording for their own work, rather than for the child's therapeutic progress. In other words, there was no single response exploring the benefits of the child replaying his activities in the Magic Land for the child himself. These findings are quite surprising, since reflection plays a significant role in NDPT. In the current practice, the therapist gives a verbal reflection on child's play; it seems reasonable to suggest that the recording/replaying option could expand the ways in which reflection could be carried out. Firstly, it could give the child an opportunity for self-reflection, thus greatly encouraging inner self-directive forces, the concept upon which NDPT is built (Piaget, 1952). Secondly, it could support the NDPT principle of *Letting the Child Lead* (Axline, 1947) even further. This, however, needs to be investigated further in future research.

Unlike the possibilities for digital assessment and play recording, options such as saving and printing were reported by the therapists to be beneficial for NDPT. The therapists did not express any concerns about these options, probably because they posed no threat for such NDPT principles as letting the child lead and accepting the child unconditionally. Indeed, as shown in the videos, the therapists mentioned that the

memory stick made it possible to save and print out the children's work in the first session, but after that they left them for the children to use as they wished, thus keeping the children in the role of MKO and giving them full freedom for self-direction.

Interestingly, this did not prove helpful in this case. Since the children were not aware of the concept of privacy protection, they did not always use the memory sticks as they were supposed to; instead, they saved their work on the hard drive of the tabletop. As the findings revealed (see Chapter 4), these actions resulted in breaches of confidentiality by making the children's saved creations available for other children and therapists to see. It seems likely that the therapists, in trying to follow NDPT principles, did not realise what the consequences of giving the children freedom to use the memory sticks as they wished would be for privacy protection issues. To prevent this situation arising in the future, therapists need to take responsibility for bringing to the children's attention why memory sticks need to be used at all times. In doing so, they would not be going against NDPT principles; on the contrary, they would be following the principle of *Setting Necessary Limits*, which are necessary to keep the child safe.

This situation illustrates once again the tension between Piaget and Vygotsky's concepts of self-direction and scaffolding in the work of NDPT therapists. On the one hand, therapists aim to give the child full freedom for self-direction; on the other, they provide help and support for the child. As the findings have revealed, the therapists did not always do this in a balanced way. For example, when the children might have been allowed to direct themselves, and given more time to master Magic Land on their own, some therapists gave the children clear instructions on the use of the application. When the therapists could have supported the children by reminding them of the consequences of not using the memory sticks, they gave the children full freedom to decide when to use those memory sticks instead. Although the technology appeared to support NDPT principles on those occasions when the therapists tried to direct

the child's play, it is yet to be established how, if at all, Magic Land could support therapists and children in ensuring the confidentiality and privacy of the child's creations on the tabletop.

5.4 Summary

In this chapter I have discussed the findings related to the research questions posed in this study. In the first section I answered *Research Question 1: 'How, if at all, could an application on an interactive tabletop be designed to suit the non-directive play therapy framework?'*

In order for the application to suit NDPT, the design guidelines for the development of the system (see Chapter 4) have to reflect NDPT principles outlined by Axline (1947). Owing to the non-directive nature of NDPT, the design guidelines differ from those used in directive therapy and in an educational context. Unlike structured goal-oriented systems, the design application in NDPT has to create opportunities for *freedom of expression and free play.* I argued that these should be the core elements for future system design, since NDPT applications have to reflect Piaget's (1952) ideas of self-direction and the process of assimilation and accommodation, some of the basic theoretical concepts upon which NDPT is built. Although it is crucial to understand and implement Piaget's concepts in the system design, Vygotsky's ideas (1978) on scaffolding and the MKO also need to be taken into consideration during the design to ensure that the system supports children in the expression of their emotional needs (e.g., by introducing both warm and 'dark' images), but also remains safe for the child's use.

Further, for the system to suit NDPT there must be *a balance between static images and interactive activities.* This is to ensure that the children are in full control of their play (e.g., manipulation of static images), but at the same time have enough opportunities for expression through new creative options (e.g., blowing wind). Once again, the theories of both Piaget (1952) and Vygotsky (1978) have been shown to be useful in order to achieve this design requirement. A discussion of the

importance of the *protecting the child's privacy* and the *complex multilayered design* concluded this subsection.

In the second section of this chapter I discussed the findings related to *Research Question 2: 'How, if at all, could a novel digital toy like Magic Land on an interactive tabletop support non-directive play therapy?'* I argued that the Magic Land software on a SMART interactive tabletop could support NDPT principles in several ways. First of all, the affordances of the hardware, the well-implemented design requirements, the children's interest and the therapists' skills meant that Magic Land was found to support the core NDPT principle of *Developing a Warm and Friendly Relationship*, enabling the establishment of trust, engagement, sharing and connecting between the child and therapist. Magic Land was also shown to be a means for the child's free expression and creativity, which are the elements of another essential NDPT principle: *Establish a Feeling of Permissiveness to Express Anything*, which is based on the processes of assimilation and adaptation necessary for the child's healthy development (Piaget, 1952).

Next, the digital toy appeared to support the *Gradual Nature of the Therapeutic Process* by being a simple and motivating tool that allows for free play and helps prepare a child for therapeutic change to occur. Finally, Magic Land was also found to be a potentially useful tool for therapy monitoring. I related these findings to the previous and current research, and argued that the use of Magic Land could be beneficial for NDPT since it has been shown to be supportive of the NDPT principles outlined by Axline (1947). I also demonstrated and discussed the complex connection between the design/use of Magic Land on an interactive tabletop and such child development processes as: self-direction, assimilation and accommodation and readiness to change (Piaget, 1952); social interaction, scaffolding and playing the role of MKO (Vygotsky, 1978); attachment and safety (Bowlby, 1980), and trust, autonomy, initiative and industry (Erikson, 1963).

CHAPTER 6. CONCLUSIONS

'Go and play. Run around. Build something. Break something. Climb a tree. Get dirty. Get in some trouble. Have some fun.'
~ Brom, The Child Thief

6.1 The Overall Significance of the Findings and Conclusions

In Chapter 5 the findings and the significance of these findings for Human-Computer Interaction and NDPT practice were discussed in detail. This chapter briefly discusses the overall significance of the findings, followed by a summary of the conclusions of the study, its limitations and suggestions for future research.

6.2 Significance of the findings

6.2.1 Implications for Field of Human-Computer Interaction

The findings of the current research are significant in several ways. First of all, it is the first attempt to formulate design guidelines for the development of a system on an interactive tabletop that would suit NDPT with children. The main significance of the formulated design guidelines is that they are built on theories of child development (Piaget, 1952; Bowlby, 1980; Erikson, 1963; Vygotsky, 1978) and therapists' opinions on the use of the system in their therapeutic practice. Moreover, the design reflects the theories of both Piaget (1952) and Vygotsky (1978), making the system unique, since its design balances two opposing schools of thought. The findings challenge the existing ways to approach system design on interactive tabletops and demonstrate how non-directive applications can be developed for those therapies that adopt a non-directive approach.

6.2.2 Implications for Non-Directive Play Therapy

The present research is among the first to investigate how, if at all, computerised toys could support NDPT. The main significance of the study lies in its demonstration of the fact that there is a place for the designed program Magic Land on an interactive tabletop within non-directive therapy. The findings suggest that despite the fears of some

scholars and the criticism of the use of computerised toys in NDPT (Zelnick, 2005; Carmichael, 2006; VanFleet et al., 2010), Magic Land appeared to support a number of NDPT principles: *Developing a Warm and Friendly Relationship*; *Letting the Child Lead/Returning Responsibility to the Child; supporting the Gradual Nature of Therapeutic Process, and Reflecting the Child's Feelings*.

Finally, the findings are significant since they are among the first to have demonstrated the complex connection between the design/use of Magic Land, the affordances of an interactive tabletop and such child development processes as: self-direction, assimilation and accommodation, as well as readiness to change (Piaget, 1952); social interaction, scaffolding and the role of the MKO (Vygotsky, 1978); attachment and safety (Bowlby, 1980), and trust, autonomy, initiative and industry (Erikson, 1963). The exploration of the usefulness of Vygotsky's concepts of spoken language, the MKO and scaffolding for the system design and in NDPT context challenged the idea that this theory was inapplicable to NDPT, since the latter was originally based on the ideas of Piaget (1952), which are considered to be in complete opposition to Vygotsky's. Therefore, the attempt to use Vygotsky's concepts contributed to our understanding of both (i) how technology could be used in NDPT and (ii) the therapeutic process of play within the non-directive approach.

6.3 Summary and Conclusions

This study has explored how to design an application suitable for use in non-directive play therapy with children of primary school age. It has also investigated how the designed application on an interactive tabletop could support non-directive play therapy principles in a real-life context. Specifically, the study investigated two research questions. Firstly, it explored therapists' views as well as the theoretical background of NDPT in designing of the application. Secondly, the designed application was tested for its technical performance and relevance to NDPT by therapists and children in interface usability tests and mock

therapy sessions. Having established its safety for children, it was further explored what supportive role, if any, the Magic Land on an interactive tabletop played in relation to NDPT principles. The main theoretical framework which underpinned the study employs the NDPT principles of a *Warm and Friendly Relationship*, *Unconditional Acceptance*, a *Feeling of Permissiveness to Express Anything*, *Recognition and Reflection of Feelings, Returning Responsibility to the Child, Letting the Child Lead and Recognising the Gradual Nature of Therapeutic Process*, as advocated by Axline (1947). These NDPT principles were further grounded in psychoanalytic and social theories of child development with the focus on the following concepts: self-direction, assimilation and accommodation, as well as readiness to change (Piaget, 1952); social interaction, scaffolding and the concept of the MKO (Vygotsky, 1978); attachment and safety (Bowlby, 1980), and trust, autonomy, initiative and industry (Erikson, 1963).

The study found that in order for the application to be suitable for NDPT it has to be aligned with the NDPT principles outlined by Axline (see above). An attempt to translate these complex principles into the guidelines for the design of Magic Land application was made. These design guidelines include the following:

DR 1 *Create a user-friendly application;*
DR 2/3 Give the child control and ensure simplicity of the application for the child's independent use; introduce no movements/prompts from the application unless initiated by the child; make contents of the application easily discoverable;

DR 4 Create a safe virtual environment for free play with no rules but opportunities for self-expression; introduce no structure but opportunities for:

(i) storytelling
(ii) creative activities
(iii) fantasy play

(iv) emotional expression

(v) new play activities inaccessible in traditional playrooms;

DR 5 Introduce no time limits for play;

DR 6 Create play with no winners/losers, no tasks or levels of difficulty; keep play activities free and unstructured;

DR 7 Limit the use of the table to the application only;

DR 8 Enable saving and printing of the child's work; ensure each child has a memory stick to save his or her work on.

In addition, unlike the existing applications in directive therapies and the educational context, application design in NDPT has to be specifically focused on such factors as free play, the balance between static images and interactive activities, provide safety but allow for the full expression of both positive and negative feelings. Protection of the child's privacy is a must, and although interactive tabletops allow for saving the child's work and tracking the child's digital play, this has to be done with the full consent of the child to suit counselling ethical framework guidelines. Further, even though the design was based on a linear framework reflecting each NDPT principle in a corresponding design requirement, the practical use of the application has proved to be complex and multilayered. In other words, each design requirement was found to be grounded in more than one principle of NDPT, which reflects the complexity of the job of translating abstract principles into concrete design guidelines.

It was suggested that, owing to its design requirements and tabletop features, the final prototype of Magic Land supported NDPT principles by becoming a tool that promoted processes of trust establishment, engagement in therapy, sharing and connecting between the child and therapist. These factors promoted a quick therapeutic

alliance thus supporting the *Development of a Warm and Friendly Relationship*, the core principle of NDPT.

Magic Land also allowed the child to stay in control of his play even when therapists themselves did not follow the crucial therapeutic principle of *Letting the Child Lead*. Further, it was shown to be a tool of free expression and creativity that supports the *Gradual Nature of Therapeutic Process* as well as allowing for therapy monitoring in a new, non-intrusive creative way. The findings also revealed that Magic Land aided in giving the children a feeling of mastery and staying in control. Although the therapists doubted whether children could follow their own guidance in discovering the features of Magic Land, the children reported that Magic Land was easy and simple to master. During the use of Magic Land, the tension between Piaget (1952) and Vygotsky's (1978) theories was reflected in the therapists' desire to let the children follow their inner direction on the one hand, and their desire to provide the children with help and support by adopting the role of a MKO, on the other.

The findings revealed that the therapists' worries and predictions that the children would gravitate to the interactive tabletop and use this toy exclusively had no foundation in practice. On the contrary, the children used the materials that were available to them interchangeably, making their choices depending on their needs and the type of play they engaged in.

The Magic Land appeared to promote some expression of a child's negative feelings as well as joy, relaxation and fun. It allowed for enhanced creative expression, fantasy play, and enhanced role-play. It did not, however, contribute much to storytelling or the exploration of identity within the therapeutic context. The findings also indicate that the Magic Land on an interactive tabletop allowed the children the freedom to choose what, how and when to play in addition to taking the pressure off them. Although it allowed for therapy tracking by means of saving and printing the child's work, these features were not employed to a great

extent by the therapists, possibly owing to the time limits and the heavy workload.

In conclusion, based on the current findings the answer to the question introduced in the title of this thesis ‘To play or not to play?’ is ‘to play!’ Nevertheless, one has to remember that in order for children in therapy to benefit from playing with a system on an interactive tabletop, it should be closely aligned with NDPT principles, as is the case with Magic Land. The children’s interest in and familiarity with technology and the therapists’ capacity to follow the children’s play in the presence of the technology are also crucial elements. In addition, the technology has to work perfectly without any breakdowns to enable the children to be in control and express their feelings through this medium.

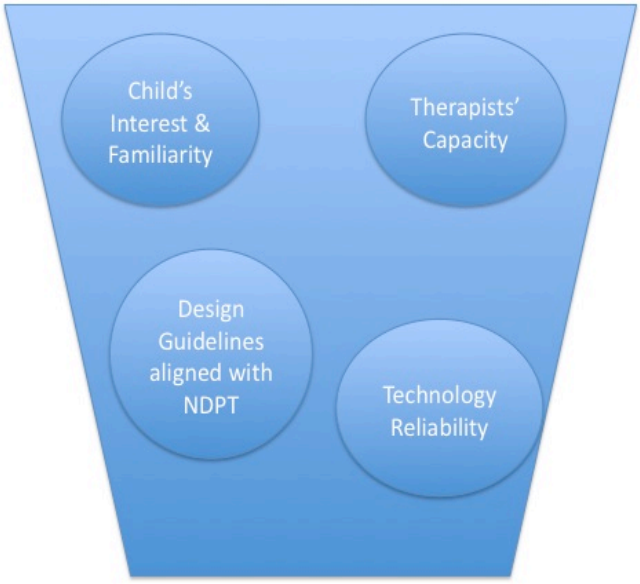

Figure 58. Main factors for the beneficial use of Magic Land in NDPT

6.4 Lessons Learnt

Based on the research data and my experience of conducting this study, I now outline main lessons that I learnt in terms of designing the software. I also present recommendations for designing software for NDPT context.

Lesson 1: Get children involved in the design

In this study I adopted a participatory approach, which means that research participants are involved in the design and testing of the software. Indeed, therapists took part in each step of the design and evaluation processes. Children, however, participated only in initial testing and the evaluation of the final product. Since the software was designed based on the therapists' requirements, it appeared that children's needs were not met in full. For example, in order to keep children safe therapists requested only warm and friendly images to be included in the Magic Land. In the evaluation stage children seemed not to have enough 'darker' images to express their troubling experiences, therefore, the therapists criticised the Magic Land for being 'too positive'. If children were involved in the design process from the very beginning, the choice of images that were included could have been very different. It seems reasonable to recommend hearing the child's voice if he/she is the one who the software is being designed for.

Lesson 2: Provide flexibility of choice and action

NDPT stresses the need for freedom to express anything in a free safe manner. As discussed earlier this is not an easy requirement to implement in the working system. For instance take a concept of 'dark images' mentioned above: what does it mean 'dark' and how 'dark' should an image be? Each child's understanding of that may be different. The image can be satisfying for one but absolutely terrifying for another. In order to meet every child's needs, it could be recommended to introduce a concept of scaling. This means that the designer might want to include a folder of neutral images, which could become brighter or darker in colours when moved on a scale right or left, correspondingly. In

addition, character(s) in these images could also be depicted with positive and negative emotions, thus, allowing the child to choose how happy or unhappy they look. Undoubtedly, it is a demanding task for a programmer but from the NDPT perspective, it is a useful solution that has much potential for the child's accurate creative expression of feelings according to specific individual needs.

Lesson 3: Software has to Ensure Confidentiality

To place the responsibility on the therapist for keeping the child's digital data safe may not be productive due to their expansive workload. As the current study has shown, using memory sticks to ensure every child's confidentiality did not work well. The software has to embed a log in/out option to guarantee safe storage of the child's digital play on the tabletop and protect the child's right for privacy.

Lesson 4: Provide options for tangible and digital toys to interact on the surface of the tabletop.

Since children did not choose digital in favour of tangible toys, but combined them both in their play, it seems reasonable to suggest finding ways of bringing these modes of play together. For example, on a number of occasions children used puppets and Water toy in the Magic Land to create a scene: Tom was taking a raccoon to the river to feed him. If that raccoon could actually interact with the water on the tabletop surface, that could potentially enhance his fantasy play and create more opportunities for storytelling. Therefore, there is a need to design the software that can allow the child combining both traditional tangible toys and the digital environments (like Water) and digital images, thus giving them more various options for expression.

Lesson 5: Less is always more.

Since I was focused on NDPT, I outlined a number of design requirements based on NDPT principles and therapists' feedback. As it is seen from Chapter 4, some of these requirements are quite abstract in nature and demanding to implement in a working system. Reflecting

back, it seems to be more sensible to focus on a smaller number of requirements placing the attention on the ways to measure their successful implementation (possibly conducting more interviews with children at the final evaluation stage). In such a way, the researcher can have more time to investigate fewer cases but in more depth (e.g. through longitudinal studies) and gain different types of data to validate the findings.

Lesson 6: Get the programmer involved with the research participants.

If the designer is not the developer himself, it is pertinent to remember that those things that are required by design may not be possible to be actually programmed. Although this may seem a given common sense fact, quite a few times therapists and I seemed to be carried away by our ideas without checking with the programmer of the amount of efforts and time needed on his behalf to develop our ideas into a real software. For this reason, I would strongly recommend to involve the programmer in some of the interviews with therapists in order to get his instant feedback on the possibility of the implementation of the design requirements into a working system. He can always provide valuable alternatives and suggestions before the designer produces paper/electronic prototypes, which will save time and energy for all.

6.5 Limitations and Recommendations for Future Research

In the previous section I outlined the lessons learnt in this research and recommendations on the software design. This section presents limitations and recommendations for future research.

The study suffered from certain limitations, among which are the following. Firstly, even though the Magic Land was shown to support the development of a warm and friendly relationship development, this was still mainly a result of the therapists having the necessary skills and knowledge of how to use the Magic Land as a tool for therapeutic relationship building. Although the Magic Land did aid in speeding up the

establishing of therapist/child contact, the relationship could have possibly been built even without the technology as a medium. More research is needed to understand the role of technology in promoting trust within the therapeutic relationship. Secondly, the study only investigated how the technology supports NDPT in the presence of the tangible toys. Further research is needed to extend our understanding of the technology as a creative tool in comparison to traditional creative materials such as paints, drawings, tangible superhero play etc. Thirdly, the video data were captured taken from the first 4-5 sessions alone and did not extend to the entire duration of therapy (a minimum of 12 sessions), which means the way in which children use the technology could change depending on their need for self-expression and on the extent of their familiarity with the features of Magic Land.

Finally, this small-scale study does not allow for the generalisation of findings. Each child is an individual who has a different interest in using technology. This, as well as therapists' expertise in using technology, could greatly affect the way the Magic Land is used. In addition, it is crucial to remember that although there are accepted guidelines for play room equipment, playrooms are not identical, nor do they always contain exactly the same type of toys, and these can also be a crucial factor in how the child makes use of Magic Land. More studies are needed to understand further how technology can be used and what are the drawbacks, if any, from its use. In addition, in-depth research is needed to explore the ways in which, if at all, the technology could be beneficial in relation to the problems from which the child is suffering. Overall, such limitations do not negate or reduce the importance of the findings obtained in this study. These limitations only highlight the fact that much work still lies ahead. Moreover, studies need to look at how the use of Magic Land is related to the child's emotional well-being in a more structured way (e.g., use Strength and Difficulty Questionnaires and quantitative research of Randomised-Control Studies). More importantly, research should be conducted over longer periods in order to allow the entire therapeutic process to be captured in more depth.

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APPENDICES

APPENDIX A

An Interview Agenda (design stage)

1) Introduction (10 min)

2) Tabletop demonstration (10-15 min)

3) Part 1 Brainstorming (15-20min):

   - What's you first impression of the multi touch interactive surface?

   - What do you think of the software applications you have just seen on the surface?

   - How (if a t all) could a multi touch tabletop/surface be used in play therapy with primary school children?

4) Part 2 Evaluation of the ideas (30-40 min)

   - What is your ideas on the usefulness of the Magic Castle in therapy with children?

   - Please comment on the potential benefits and disadvantages of introducing the following digital toys in non-directive play therapy with children (i) Room 1 – Dollhouse; (ii) Room 2- Battlefield; (iii) Room 3 – The Basement; (iv) Room 4 – Water and Sand & Flying Feathers; (v) Room 5 – Rosebush; (vi) Room 6 – Emotive Language.

   - What do you think about introducing sounds and tangibles of different textures to the software?

   - In your opinion, what effect can the software have on play therapy when a child can create own tools of expression (e.g. when a child can give shapes, colours, different emotions and sound to images/toys created by him on the screen)?

   - What benefits (if any) can the use of the tabletop have for play therapists in terms of being able to capture the process of the child's play and save the child's work in the end of the session?

5) Concluding thoughts (recap + summary of the interview)

APPENDIX B

Participant Information Sheet (Play Therapists)

Title of Study: *A Framework for the Development of Interactive Digital Technology Software for the use in Play Therapy with Primary School Children.*

You are being invited to participate in a research study. Before you decide, you need to understand why the research is being done and what it would involve for you. Please take time to read the following information carefully and discuss it with your colleagues. If there is anything that is not clear or you would like further information, please contact us using the details provided below. Take time to decide whether or not you wish to take part.

What is the purpose of the study?
The purpose of this research is to investigate how children and play therapists could use digital technology at different stages of play therapy. We designed software which allows a child to make avatars, create comic books, pick, resize and rotate images as well as draw and colour in on a special multi touch computer. This computer is called a multi touch tabletop and has no keyboard or a mouse but works by the same principle as an iPhone or ipad through a direct touch of the screen. This study aims to set a paradigm of understanding of what advantages and barriers the use of this software will have in play therapy.

Why have I been invited?
You are a play therapist/use therapeutic play with primary school children.

What is required of me?
You may have already participated in one to one and/or focus group interviews and role-plays at the design stage of the research. Now you are being asked to

1) use the software in your play therapy work with children referred for play therapy. Some of your play therapy sessions will be video recorded;
2) keep a diary about the use of the software
3) Share your experience of using the software in your work in one to one interviews with the researcher.

You may be asked for permission to show some of the video recorded play therapy sessions to your colleagues with a purpose of getting their feedback on the use of the technology in play therapy. This, however, could be done ONLY if you and the child's parents sign a separate consent form allowing the researcher to use your data in this way. The researcher will discuss this with you first and if you agree she will ask you to give her your written permission.

Risks to participants
There is no risk anticipated for you or your child while taking part in this study. The information gained will NOT be used for any other purpose than the study and individual Trusts or persons will not be named. The researcher Olga Pykhtina will ask your permission to use pictures and videos of your video recorded play therapy sessions at public presentations and conferences and will do so ONLY if you and the child's parents give their written permission for that.

Will my participation in the study be confidential?
Yes, all information provided by you will be kept strictly confidential and only used by
the researcher. When the information gained from all the participants is presented in project reports or publications any identifiers will be removed to ensure you/your child remain anonymous. Videos will only be stored in password protected computer systems.

What if I change my mind about taking part?
This study is conducted in accordance with Newcastle University Ethics Policy and Code of Good Practice in Research, which ensure your rights to leave this study at any time without any explanation or obligation.

What happens after I have taken part?
You can send a contact email to the researcher Olga Pykhtina so that we can send you a summary of the findings when the information is analysed and a report produced. You can request this even if you do not wish to take part in the study. To do this, please email and request to receive the summary findings in August 2011.

What if there is a problem?
If you would like to provide feedback or have a concern about any aspect of this study, please speak to Olga Pykhtina. Remember you may withdraw from this study at any time.

Contact details
If you would like further information about this research, please contact:

Thank you for taking your time reading this!

APPENDIX C

Therapist's Consent Form

Name of Participant:

I am a play therapist/ I use therapeutic play with children ☐

I agree to take part in this study. This agreement is of my own free will.
I have had the opportunity to ask any questions about the study and I realise that I may withdraw from the study at any time without giving a reason.

I have been given full information regarding the aims of the research and have been given information with the Researcher's names on and a contact number and address if I require further information. All personal information provided by myself will remain confidential and no information that identifies me will be made publically available

I agree to my video recorded play therapy sessions, diaries and audio recorded interviews to be stored in a password protected file and used as a data source in this study.

I am free to ask any questions at any time before and during the study. I have been provided with a copy of this form and the participant information sheet.

I understand that I will do the following: use the software on multi touch tabletop in my play therapy sessions with primary school children; keep a diary about my experience of using the software in my work; share my views on the software with the researcher and my colleagues in one to one and focus group interview(s).

Name of participant (print)……..Signed……..
Date……
Name of researcher (print)……Signed……..
Date……

Researcher's contact details:

APPENDIX D

Participant Information Sheet for Parents

Title of Study: The title of the study is 'A Framework for the Development of Interactive Digital Technology Software for the use in Play Therapy with Primary School Children'.

You are being invited to participate in a research study. Before you decide, you need to understand why the research is being done and what it would involve for you. Please take time to read the following information carefully and discuss it with your family. If there is anything that is not clear or you would like further information, please contact me using the researcher's details provided below. Take time to decide whether or not you wish your child to take part.

What is the purpose of the study?

The purpose of this research is to investigate how children and play therapists could use digital technology at different stages of play therapy. I designed software which allows a child to make avatars, create comic books, pick, resize and rotate images as well as draw and colour in on a special multi touch computer. This computer is called a multi touch tabletop and has no keyboard or a mouse but works by the same principle as an iPhone or ipad through a direct touch of the screen.

Why have I been invited?

Your child is being asked to participate in this research study because they meet the selection criteria: 1) being of primary school age;
2) referred for play therapy sessions with a therapist who agreed to use specially designed software by us in their work with children

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What is required of me?
If you wish your child to participate in this study, you and your child will be asked to do the following:

You: 1) allow your child to use the software in their play therapy sessions
2) allow the researcher to video record your child's play therapy sessions; show and discuss those videos with other play therapists with a purpose of getting their feedback on the use of the designed software in play therapy sessions.

Your child: use the software in their play therapy sessions if they so wish

Risks to participants

There is no risk anticipated for you or your child while taking part in this study. The information gained will NOT be used for any other purpose than the study and individual Trusts or persons will not be named (unless you grant the permission to use pictures and videos of your child's play at conferences through ticking a box on the consent form provided by the researcher)

Will my participation in the study be confidential?

Yes, all information provided by you will be kept strictly confidential and only used by
the researcher. When the information gained from all the participants is presented in project reports or publications any identifiers will be removed to ensure you/your child remain anonymous. Videos will be stored in password protected computer systems.

What if I change my mind about taking part?

This study is conducted in accordance with Newcastle University Ethics Policy and Code of Good Practice in Research, which ensure your rights to leave this study at any time without any explanation or obligation. You also have the right to withdraw your data without explanation and retrospectively but only until the point that your data is anonymized.

What happens after I have taken part?

You can send a contact email to the researcher Olga Pykhtina so that we can send you a summary of the findings when the information is analysed and a report produced. You can request this even if you do not wish to take part in the study. To do this, please email and request to receive the summary findings in August 2012.

What if there is a problem?

If you would like to provide feedback or have a concern about any aspect of this study, please speak to the researcher

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Contact details of the researcher:

Thank you for taking your time reading this!

APPENDIX E

Participant Consent Form (Parents)

Your name: Your child's name:

I am a parent of a child who will use the designed software in their play therapy sessions ☐

Child's gender: Male/Female (please circle appropriate)

Your date of birth: Child's date of birth:

I consent for my child to participate in this study. I am satisfied with the instructions I have been given so far and I expect to have any further information requested regarding the study supplied to me at the end of the investigation.
I have been informed that the confidentiality of the data I provide will be safeguarded. I am free to ask any questions at any time before and during the study. I have been provided with a copy of this form and the participant information sheet.
I understand that I will allow my child to participate in video recorded play therapy sessions with the designed digital technology software

I agree to the video of my child's play to be shown and discussed with other play therapists who participate in this study: ☐

I agree to the video of my child's play could be shown at public presentations: ☐

I want the video to be seen only by the researcher: ☐

I have not been coerced in any way to participate in this study and I understand that I may terminate my/my child's participation in the study at any point should I so wish. I am at least 18 years of age. I also understand my rights to withdraw my data without explanation and retrospectively but only until the point that my data is anonymized.

Data Protection: I agree to the project researcher Olga Pykhtina processing personal data that I have supplied. I agree to the processing of such data for any purposes connected with the Research Project as outlined to me.

Name of the child's parent: (please print)…….....
Signed…….. Date……

Name of researcher (print)…….....
Signed…….. Date……

Researcher's contact details:

APPENDIX F

Child's Information Sheet

Dear Girl/Boy,

My name is Ola and I am studying at Newcastle University. I am learning how to help children who are not feeling well to feel better by designing special play activities for them on a new computer. You can touch this computer screen directly with your hands without a mouse or even a keyboard. I would like to invite you to come to play on this computer with the play activity I have designed. I'm asking you to come because I really need to know what you think about this kind of play ☺

- You are being asked to come to a room full of toys where another lady and I will be waiting for you. Your dad/mom will take you there (and tell you when it is going to happen) and will pick you up later so please don't worry about how and when you'll get there!

- This lady who you are going to spend some time with (mom/dad will tell you more about it) will show you this new computer and will ask you to play on it. If you and your dad/mom allows, I will video record your play so that I could watch it later and see how the game could be made better.

- After you finish playing, I will ask you some questions about what you liked or didn't like about that play; how the play could be made better. You don't have to answer these questions if you don't want. It is okay to say you didn't like the play if you didn't like it or you are not sure if it is good or not.

Thank you very much for your time!
It is very important for me to know what you think about the game on that new computer ☺

APPENDIX G

Picture Consent

Web Page / Electronic Media / Newspapers / Brochures

I hereby consent to having my child/children's pictures appear in electronic media or print publications that the researcher Olga Pykhtina might choose to release. I understand that my child/children's pictures may be on display in accordance with any of the above mentioned activities.

I further acknowledge that my child's name may or may not be used in connection with his/her picture.

I hereby agree on behalf of my children to waive any claims against Olga Pykhtina. If at any time, I want my child's photograph to be removed from the web site or other electronic media, I acknowledge that it is my responsibility to inform, in writing, Olga Pykhtina of this decision.

Child/Children's name(s):

Parent/Guardian Signature:

Date:

Contact details for the researcher:

APPENDIX H

Participant Debriefing Form

The title of the study is 'A Framework for the Development of Interactive Digital Technology Software for the use in Play Therapy with Primary School Children'

We thank you for participating in this study!

As you already know the purpose of this research was to develop and explore the use of interactive digital software in Play Therapy with Primary School Children. Despite the benefits and potential the technology brings into work with young children in educational settings there is hardly any research-based evidence on the use of technologies in such an area as play therapy.

Moreover, there are just a few studies done into *why* and *how* apply digital technology into Play Therapy with children. In this study we designed software and explored how it could be used in play therapy with children. If you are interested in this area of research, the following introductory sources are available at the library:

- Bers, M., Gonzalez-Heydrich, G., DeMasco, D. (2001) Identity Construction Environments: Supporting a Virtual Therapeutic Community of Pediatric Patients Undergoing Dialysis in Anthony, K. And Lawson, M. (2002) *The Use of Innovative Avatars and Virtual Environment Technology for Counselling and Psychotherapy* available at http://www.kateanthony.co.uk/InnovativeAvatar.pdf

- Hancock, M., ten Cate, T., Carpendale, S., and Isenberg, T., (2010) 'Supporting Sandtray Therapy on an Interactive Tabletop'. In Geraldine Fitzpatrick, Scott Hudson, Keith Edwards, Tom Rodden, and Elizabeth Mynatt, eds., *Proceedings of the 28th ACM Conference on Human Factors in Computing Systems. New York. ACM Press'10, pp.2133–2142.*

Now I would like to ask you about your experience of participating in this study. I, the project researcher Olga Pykhtina, would get in touch with you within next week in order to arrange for a short interview in order to learn about what it was like for you to be a participant in this study (what worked well and what could be improved in the future studies)

If you have any complaints, concerns, or questions about this research, please feel free to contact me.

Contact details for the researcher:

Thank you again for helping me with this research!