'Seeing' play through the virtual looking glass: A metaphysical laboratory for de-framing and re-framing play for ECE

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Dedication:

I dedicate this thesis to my two greatest fans and supporters, that have been cheering for me throughout most of my journey towards completing this work, but never got to see it being submitted.

While you both left prematurely, you continued to be my strength, to help me finish.

In loving memory of my:

***Mother Marijana Hiter** (April 1958 – September 2019) and*

***Sister Branka Čuš** (April 1982 – August 2020)*

May you play happily among the stars until we meet again!

i. Abstract

In this thesis I address the ambiguous nature of play by interrogating alternative ways of 'seeing' play beyond what I assert to be its contemporary *Enframed* state. I argue that to gain alternative insight into the basic features and functions of play, the concept of play needs first to be *Deframe*d. Play is described as an ambiguous, elusive phenomenon, which makes it susceptible to being framed in ways that deter learning and development of children in ways consistent with the basic purpose of play. Such *Enframing* is evident across many situations and settings, including unsubstantiated assumptions about the way children's learning is best assessed in early childhood education. These assumptions contribute to misperceptions of teachers regarding play, including the effects of their presence or absence in children's play. The ambiguity of play also accounts for difficulties in empirical research; applying traditional researching approaches to investigate such an elusive phenomenon has proven ineffective. These investigative shortcomings have contributed to a lack of clear pedagogical and methodological insights about play. As an alternative methodological framework to 'see' beyond the elusiveness of play I shift the focus from asking questions about how play can support learning to instead employing a phenomenological investigation of what play is that enables *Deframing.*

I argue that to gain alternative insight into the basic features and functions of play, the concept of play needs first to be *Deframed*. Utilising Heideggerian phenomenological notions of *Enframing* and *poiesis,* I enter into a metaphysical laboratory in the virtual space, accessed through virtual reality (VR). This space offered insights into players' subjective experiences when engaged in play. Play could thus be examined through empirical engagement rather than studied as an object.

Two distinct yet related theoretical concepts were employed to encounter the phenomenon of a virtual representation of play: visual pedagogies and the embodiment theory. Visual pedagogies focus on the implications of visuality on teaching and

learning and often rely on video as an empirical research method. Embodiment theory accounts for the expanded spectrum of sensorial modalities beyond the visual which enables an immersive experience. At the intersection of these two theories a new branch of pedagogy arises, referred to in this thesis as immersive pedagogy.

The study found that the methodology applied was very effective in helping teachers develop alternative insights about play. Their centre of attention shifted from play as a tool for learning towards a focus on free play as a self-actualising tool for human development. In their interaction with the immersive experiences, teachers encountered a number of emotional responses that affirmed the use of virtual reality as a suitable metaphysical laboratory, available on the virtual side of the cybernetic looking glass, as a place for thought, reflection and phenomenological transcendence, referred to by Heidegger as *poiesis. Poiesis* is an aesthetic, esoteric and metaphysical term that brings forth a multiplicity of meanings of phenomena.

Deframing through *poiesis* was affirmed by play revealing itself to teachers in a new way. By becoming part of the dynamics of play and by assuming the role of 'invisible' observers genuinely invested in play, teachers were able to develop fresh insights about play's inner workings. It revealed itself in a new way. On the basis of their experience, they re-framed play for themselves subjectively, thus separating it from its unproven association with standardised learning.

Some of the potential implications of these discoveries were suggested by participating teachers themselves, who proposed the methodology be used by teachers as a reflective tool for learning more about educational phenomena. They also suggested that the tool would enable parents and other educational stakeholders to develop important insights about play-based curricula, which are currently difficult to comprehend. It is possible that on a larger scale these insights, which enable play to define itself to the players, could usefully change current perceptions of play for teachers, parents, researchers and educational policy makers.

Key Words:

Early childhood education, play, methodology, visual pedagogy, immersive pedagogy, virtual reality, immersive video, learning from experience, embodied cognition.

ii. Contents

iii. Prologue: A Reflection About Play

As a child I enjoyed playing on my own, involved in creation of fantasy worlds, while inventing and solving the problems of my imaginary characters. But play truly manifested itself for me when I was outside with friends. During my early years, growing up in Slovenia, my friends and I were given a lot of freedom to explore the neighbourhood and its community. My parents trusted me to keep myself safe and to learn from my mistakes by making them, and they valued the friendships I made and the activities we were involved in. These friendships were deep and meaningful. We knew each other well and appreciated each other's individuality. We used our creative thinking to invent and reinvent play scenarios and games daily, construct huts, go for adventure walks in the forest or bicycle trips to other neighbourhoods. Play made life an adventure. The excitement of a new idea for a yet unexplored activity or place brought exhilaration, joy and determination to succeed in our endeavours, and a sense of purpose in the world. Being engaged in play with them made me part of something I treasured and loved. I knew that I could find refuge from the troubles and occasional harsh realities of the real world, in the embrace of free play alongside my friends. It felt as though our options were limitless, and this filled me with a sense of freedom that I have brought with me into adulthood.

When I migrated to New Zealand 14 years ago, I was delighted to see play being valued in the context early education. This prompted me to gain an ECE teaching qualification here, having a secondary teaching degree before. Being an active life-long player, I appreciated the status granted to play in the curriculum and found it amazing to work alongside people who did the same. However, I have realised that when play is used as a tool for learning, children lose their prerogative to exercise their free will and choice in play. I have observed how others, specifically adults, impose their views and attempt to mould play in line with their own design and I have seen motivation to continue playing drop and children become less creative. For example, teachers may feel they

need to assert themselves as ‘teacher’, and take the play of children over in order to mediate academic learning, such as teaching the children in their care colours, letters and mathematical concepts. I was aware of a contradiction when I observed well-intended, adult-guided academic teaching being related to play in this manner. I struggled to see how play could continue to operate efficiently if it was being directed by an outside agency that disrupted its natural flow, freedom and creativity.

I became concerned that the current tendency to frame play as a didactic tool for academic teaching and learning was having detrimental effects on children’s development and their right to play freely. I felt that many of the values that I have identified above as being important to me as a child were being eroded by those who objectify and intellectualise play and impose their views of play on others. I could see how innovative thinking and creative freedom were being stifled alongside play, and observed teachers’ frustration when they tried to articulate the importance of free play to ears wide shut. With increasing pressures for outcomes I could see adult eyes glancing away from children at play, convinced that they were not missing anything important, while their gazes were instead pulled towards standardised academic learning dictated by a prescribed curriculum. I wondered how the deprivation of play activities was affecting children’s development, well-being and belonging. Time to play is decreasing at home, in schools, early years centres and in the curriculum and while many adults believe that what they are doing is for the benefit of their children’s futures, no one takes the time to listen to the ones those changes affect the most – the children.

My observations made me think deeper about play, its meaning, essential properties and inner workings. As a result, certain thoughts and attitudes have crystallised. These conceptions of play were however overwhelmingly influenced by the feelings that accompany them and these conjured up memories, many from childhood, but not all. When I brainstormed words that I associated with play and observed its many-layered

connotations, I for me, I wondered about the subjective nature of these concepts. The words that manifested when thinking about play were mostly words that describe states of being. I associated play with joy, fun, laughter, happiness, love, friendship, freedom, exploring the unlimited possibilities the world offers, creativity, refuge, ownership, excitement, purpose, being me and expressing myself, sharing, being active, belonging.

As I formulated my personal meaning of play, I found myself unable to detach my affective self from the concept. For me most of these words carry an aesthetic, spiritual and perhaps even an esoteric connotation with them, due to the deep connection to emotions and my inner being that receives its impulses from life itself. They also represented my connectedness with the world and others that inhabit it. Philosophers through the ages have meditated on these same notions of freedom, happiness, purpose, individuality, love, and creativity and have not arrived at a common definition for any of them. How then can I expect to define what play is, if for me it encompasses notions that themselves elude conceptualisation?

So where then does this leave play? Perhaps play is broader than just a number of brainstormed concepts from one individual, especially if I consider the fact that play is displayed by all mammalian life. Would a cat need to associate play with any concept? Perhaps play does not need to be conceptualised, framed into something objectifiable to be consequential. Play just needs to run its course, as it is its own purpose. The purpose of play is to play. If we consider this to be true, then that would make play closely related to life itself. What is the purpose of life, if not simply to be lived? Furthermore, if arguably life should not be considered an object, perhaps the same applies to play. These notions seemed to strongly suggest phenomenology as the theoretical paradigm that might provide the appropriate arena to interrogate play. This suggestion was affirmed further as I continue with my ruminating.

Yet if we do not objectify play at all, are we then still able to think about it, muse about it, have conversations about it, since arguably as soon as we do any of these, we render

play an object of our thoughts, musings and discussions. In other words, if I am claiming that play is not an object, and that it - in its unobjectifiable way - eludes all conceptualisation, I am paradoxically saying it is not an object while at the same time making it one. This would then mean that any discussion about play would be a lie. This thesis would be a lie. While in essence, I believe this to be true, if I did however adhere to this thinking, then this would make for a very short thesis: 'Play is not an object, so do not write about it.' I think there is a difference, however, between talking about play as a fluid elusive subjective matter that manifests itself differently for different people in different circumstances, and intellectualising it by attaching certain absolute qualities to it while cataloguing objectifiable truths about the phenomenon. I have decided not to take the latter approach in my attempt to explain play, but rather to metacognitively moderate objectifying tendencies to instead focus on subjective experiences with play, while keeping in mind that this is all they are – impressions, subjective perceptions, realisations and insights. I consider that taking the approach of learning about how play is conceptualised subjectively does not make it any less interesting from a researcher's point of view, especially as subjective interpretations of play may carry a certain kind of intrinsic, 'knowing' that could be attained by experiencing play through the act of playing that surges in oneself as innately purposeful as life itself.

If the purpose of play is to play, what then is the purpose of playing? I think that play carries an important role for the development of life skills of any mammal, such as skills that will enable us to survive, provide for ourselves and establish a successful existence that will allow for procreation of life. Perhaps this sentence illustrates the key link between play and life: play enables life and life enables play. Play is also important for developing social skills; for example, wolf cubs learn about hierarchy and the rules of the pack through social play interactions. As play is often grounded on recurring behaviours it seems to have a repetitive rhythm engraved in its fundamental manifestation as an activity. I was led to believe through my biology studies that this

is due to repeated action strengthening neural connections in the brain, automating the action through the process of myelinisation of neurons. Repetitive motor actions also build muscle strength. It is hence clear to me that play has some fundamental developmental functions regarding mammalian development.

At this point I am asking myself about the connection between play and learning. At the start of my journey with this thesis I struggled to arrive at clarity regarding this relationship. Play and learning seem to be almost synonyms in early childhood education; however, while I did understand the developmental functions of play, I was still hesitant to imply the same level of importance of play for learning. I could see that play can have some advantageous effects on certain types of learning that are closely connected with the development of social or motor skills. However, I was not sure if play was as strongly linked to cognitive acquisition of abstract knowledge (academic learning) as many people believed. My engagement with this thesis answered this and many other questions for me and the teachers that were involved with the study.

1. Introduction:

This thesis demonstrates that teachers can experience child's play beyond the constraints within which play is *Enframed* by educational policy makers. It identifies a problematic attitude towards play prevalent in the contemporary Western world, where play is being *Enframed* beyond its defining properties and functions. The question concerning play is interrogated phenomenologically and metaphysically to arrive at the reasons for play being intellectualised as a neoliberal tool for achieving standardised outcomes in the early childhood curricula. A poietic liberation of play is suggested as a way to modify entrenched attitudes towards play, by allowing adults to arrive at subjective truths regarding the phenomenon. through becoming part of its inner workings. This liberation of play was put to the test in the empirical part of the thesis which I have called "a framework for conceptual processing".

Virtual Reality technology (henceforth referred to as VR) was utilised to *Deframe* play in a metaphysical laboratory through a methodological process of seeing as *poiesis*. Such immersive experiencing of knowledge in VR enabled teachers to attain a transcendent state of being, where immersive pedagogies formed a cybernetic looking glass for seeing a multiplicity of alternative insights of the essential properties and inner workings of play.

This described process pertains to the researcher's personal educational philosophy, which is grounded in the belief that, in order for an idea to be fully realised, it needs to be developed through extensive reflection, musing and 'playing' creatively with concepts, thoughts and theories, before they are trialled empirically in practice. The thesis therefore entails my personal reflections, alongside philosophical theorising derived from my own thinking and informed and validated by the thinking of others, and it draws on an empirical study that arose from creative play with abstractions of the mind. Therefore, the next section focuses on the origins, intentions, and the possibilities this thesis may offer.

This thesis arrived at its unique amalgam of play and VR as subjects of research as a result of my involvement with and interest in the field of early childhood education as a profession and an extracurricular fascination with modern technology, in particular with VR. These separate interests converged in the quest to understand play.

Upon starting this thesis, my focus was on making play visible to teachers through VR technology and on devising a series of meanings in the form of universal truths regarding play that could be grasped, delineated and applied practically to the curriculum. However, as a deeper understanding of play unfolded through philosophical investigations and empirical findings, the thesis branched out towards a different set of research questions and arguments. It became apparent that the complexity of play reveals itself in different forms, at different times, and differently for different people, which persuaded me to eventually embrace the multiplicity and the diverseness of the subjective meanings through which play reveals itself.

My interest hence extended to investigation of the specific circumstances under which play discloses itself to the observer and the ways that VR technology might aid observers to attain a state of being through which they would be able to engage with the diverse inner workings of play. While the initial intentions for this study were to bring forth play as a visible objectifiable phenomenon to aid teachers in articulating play for learning purposes, it eventually transpired that these kinds of attitudes towards play were the very ones that limit the way play is experienced, and consequently such framing of play contributes to the very ambiguity I was attempting to see past.

Therefore, while the initial assumptions that play would have been 'seen' more clearly if a wider range of senses to experience it immersively were involved were proven to be well founded, the initially intended application of the method to reveal play in a systematic ordered way would have resulted in a further *Enframing* of play, rather than a liberation that would let it reveal itself freely.

This enhanced thinking prompted me to rethink my strategies regarding the use of VR technology. I decided to draw on my own experience with the technology, aiming to bring forth a unique state of being for the body and mind that I had experienced several times while engaged in a number of different virtual scenarios. What was notable about these situations was a sense of full immersion in the virtual world, where it was possible to transcend the limitations of the self's worldly being by engaging completely with the digitally summoned experiences at hand. In that state, one may find oneself highly susceptible to even the smallest of sensations and may manage to 'see' the experiences with much added vibrancy and richness: the self can, in a sense, connect with this state in a way that is intensely personal and encourages alternative insights through seeing phenomena from several new perspectives. I considered this state of being as in some ways related to the experience of play, insofar as it also felt like an aesthetic, spiritual and esoteric experience. Consequently, the question arose: what new insights could be attained regarding play if it were to be examined in such a way? As VR can facilitate a similar state of being to the one play is being experienced in, I wondered if perhaps this relatedness would enable an observer of play in VR to experience it similarly as in reality. The key to achieving this state was to enjoy the experience without any pre-set outcomes in mind. To better understand and articulate this way of experiencing phenomena, it needed to be philosophically interrogated.

Phenomenology was found to be best suited for interrogating play through VR technology and to help explain the metaphysical entanglement of the two. The book that most grounded this thesis was Heim's *The Metaphysics of Virtual Reality* (1993), in particular its focus on the establishment of a transcendental metaphysical laboratory in VR, related to the philosophical underpinnings of Heidegger's phenomenology. Heidegger's key notion of *Enframing* enabled the interrogation of the contemporary Western attitudes towards play, which frame it as a standardised tool for learning, and aided in explaining the application of the suggested VR technology. Current education policy implementation systematises, standardises and nationalises early childhood

education to permit international competition and comparison, while developing services in ways that serve the economy (Westbrook & Hunkin, 2020) and raises concerns that governments are using early childhood curricula to *Enframe*[1] pedagogy in ways that meet their agenda.

The state of transcendent being referred to above is another notion that Heidegger draws on, *poiesis*. *Poiesis* is an aesthetic, esoteric and metaphysical term that is elicits a multiplicity of meanings of phenomena. It is a unification process where the body and mind collapse with the observed phenomena, enabling a deeper insight into its basic nature. Consequently, learning through experiencing the world with the bodily senses became an important methodological positioning of the thesis that was made possible by using embodiment theory, also rooted in the phenomenological paradigm.

Furthermore, methodologies and methods aligned to visual pedagogies (such as video) were adapted in the empirical part of the study, to form the next step in the pictorial evolution under the newly proposed field of immersive pedagogies by employing a form of Virtual Reality called immersive video. The immersive video method was used to represent play experiences to teachers in an early years context in order for the researcher to be able to answer the research questions.

The results of the empirical study conducted in this thesis showed that the participants of the study were indeed able to achieve the aforementioned state of being, wherein they referred to themselves as the quiet observers, who could see many facets of play, while becoming part of its inner workings. Throughout the virtual experience they were invested in play with body and mind, while experiencing a raft of different emotions, including joy. They developed a number of alternative insights into play, and some of

[1] Heideggerian notion of *Enframing* is explained in Chapter 3.

their prior attitudes towards play changed dramatically and became clearer. Before the viewing, the teachers' focus had been on how play might enable targeted learning; after the experience they fore-fronted play as a self-actualising tool without any specific intended outcome. Their focus also shifted from viewing themselves as teachers who facilitate learning for children at play to themselves becoming participants in play, who enrich, facilitate and extend play, rather than learning.

The dramatic changes in attitudes of teachers regarding play suggest that others such as parents, researchers and policymakers would also be curated from the *Enframed* way of seeing play, towards a deeper understanding and an evolution of play.

The *Enframed* attitude towards play enabled discourses associated with the erosion of play to appear in ECE and school curriculum documents across the globe (Jarvis et al., 2014), as well as in contemporary learning ideologies that frame play as simply an instructional teaching method to achieve pre-set learning outcomes dictated by a progressivist rhetoric of play (Sutton-Smith, 1997). Vygotsky (as cited in Connery, John-Steiner, & Marjanovic-Shane, 2010) cautioned that if children's needs, incentives to act and affective aspirations are not the motivation for learning and teaching, a terrible intellectualization of play could occur. The widening agenda of commercialism that has influenced education is threatening to achieve just that, as it "influences (some would say manipulates) and helps shape ideas about play and the forms it might take" (Lewis, 2017, p. 11).

To help counter these discourses the researcher proposes the use of rapidly advancing Virtual Reality technologies as a form of looking glass to overcome the *Enframed* attitude towards play and make it possible to see past the illusion of play and attain alternative insights into its essential characteristics.

1.1. **Research Questions:**

What is the potential for immersive video to transcend existing notions of 'play' for teachers in ECE?

- *What are the specific circumstances under which play discloses itself as a phenomenon to the early childhood teachers through VR?*
- *What is the impact of teachers' altered perspectives in relation to pedagogical practice concerning play?*
- *What additional contributions can sensory and/or embodied engagements through VR make to teacher pedagogy?*
- *What other contributions may VR hold for teacher pedagogy as a consequence of engagement with VR?*

1.2. The Structure of the Thesis

This thesis is broadly divided into a philosophical/theoretical interrogation and a methodological application of an empirical study, through which a proposition concerning the disruptive and expansive potential of immersive VR was tested out in an educational setting in order to develop new, subjective insights and attitudes regarding play in the early years. The application is wrapped up in a philosophical examination concerning the nature of seeing, and the consequences of *Enframed* attitudes. The empirical application of a newly developed methodology using immersive VR and teacher interviews is encompassed in this research, followed by a philosophical interrogation of its utility for understanding play.

The second chapter of this thesis discusses the importance of play with a focus on its diverse functions for developing physically and mentally healthy children. This chapter also introduces the tensions between play and learning, and these are further expanded

on in Chapter Three, where perceptions of play in the contemporary Western world are considered. This chapter discusses how the elusive nature of play enables it to be framed in ways that are inconsistent with its basic nature and function. Different forms of play capture are discussed next, including their effects on early childhood pedagogy and curriculum. Contextual factors that create and influence play are also addressed in this chapter, together with some of the major concerns in the research of play. The concluding section of the chapter attempts to explain the metaphysics of play, through a phenomenological lens, drawing on Heidegger's notion of *Enframing* (*Gestell*).

The fourth chapter extends on those philosophical interrogations, by examining Heidegger's views on the concept of *poiesis,* which is then applied to the educational phenomenon of play, as a way of examining its current *Enframed* state. A possible application of *poiesis* is investigated in line with the phenomenological paradigm of seeing play in VR, by employing a raft of theories regarding learning from first-hand experience via the bodily senses. This notion is further explored using embodiment theory, which is fundamental to this thesis's methodological orientation. Next, ways of seeing and representing knowledge are explored in relation to pedagogy, as well as a new subcategory of pedagogy, 'immersive pedagogy'. Together these are used to generate new pedagogical insights about play through virtual immersion. Understanding the evolution of knowledge through time will highlight why a return to learning form first-hand experiences is important to better understanding play. Lastly, how immersive videos can become a 'cybernetic looking glass' of phenomenological research to support teachers in developing alternative insights regarding play is explained. The cybernetic looking glass refers to the ability of a person to move through the fabric of physical reality into virtual reality; in the case of this research it enables people to engage with the metaphysical laboratory located in the virtual space.

In Chapter Five I explain the role of the researcher, followed by a newly developed analytical framework that enables effective video analysis. This is followed by the presentation of the research design, and ethical considerations.

The findings chapter starts with a comprehensive discussion of what meaning was derived from the results and how this is important for the focus of the thesis. This is firstly discussed in relation to the analytical framework and afterwards in terms of the philosophical notions of *Gestell* and *poiesis,* drawing parallels throughout to relevant theory research. This is followed by conclusions drawn in relation to the research questions of the thesis. Affordances, limitations and implications of the study are outlined to conclude the final chapter.

The thesis is contained in a reflective musing in the form of a prologue, before the first chapter and an epilogue after the last chapter. This satisfied my need for playful thinking and writing regarding the concept of play and illustrates my motivation for undertaking this study. It also shows the growth and evolution in my own understanding, perceptions and insights regarding the matters investigated.

In the results section of this research the data sets are established to present the results in a categorical manner. Quantitative results are tabulated and represented graphically, while qualitative results are shown in the form of videos.

2. Play and Its Attitude in education

To understand the problems that play faces in the contemporary world and to appreciate the potential of VR technology to enable teachers to broaden their thinking about the importance of play in early childhood, requires some understanding of the social, emotional and developmental implications of play as well as the complex positioning of play in Western educational theory and practice. Hence, Chapter Two will theorise play in relation to the research objectives of this thesis, including the investigation of the contemporary paradox of play and its relation to the ambiguous properties of play.

Play has been widely examined, theorised and researched and its significance for human development and learning has been articulated countless times (Lewis, 2017). Perhaps unsurprisingly, then, a contradiction has arisen in the past two decades. Paradoxically, even while an increasing volume of academic and empirical research-based evidence stresses the importance of play in childhood for the development of healthy adults, there is mounting evidence of a trend towards the severe erosion of play in the Western world (Brown & Patte, 2012; Jarvis et al., 2014; Larsen, 2015; Lewis, 2017; Roopnarine, 2012; Sevimli-Celik, 2017; Sutton-Smith, 1997). To explore the cause for the emergence of this contemporary paradox, the attitudes towards play, in the western world, will be investigated next.

Play is a heterogeneous phenomenon that relies on the eye of the beholder (Jarvis et al., 2014). It is often located within a person's subjective ideology, which makes understanding play outside of one's own perception of it difficult (Sutton-Smith, 1997). As ideologies of play are commonly used to frame play, Sutton-Smith (1997) has argued that in most cases ideologies become 'rhetorics of play'. People who aim to control play by imposing their own rhetoric on it render themselves unable to conceptualise its diverse nature (Butler, 2010). Hence most scientists, researchers and policy makers in education define play from their own perception, ideology or rhetoric of play (Sutton-Smith, 2008), rendering play a highly subjective phenomenon and thus

easy to bend to one's own agenda, as its fluidity permits it to be applied in multiple ways. This leaves play vulnerable to being used in harmful ways and for purposes that defy its basic purpose and function (Lewis, 2017; Sutton-Smith, 1997). When play is perceived in such a manner, the observers are yet again positioning themselves outside the dynamics of play and hence what they are really researching is the illusion play offers rather than play itself.

2.1. Play and its location in education

In a world where educational outcomes are increasingly expected to be quantifiable and measurable, play struggles to illustrate its worth in dominant policy-making due to its ambiguity (Jarvis et al., 2014; Roopnarine, 2012; White et al., 2007). The decline of respect for play-based learning is resulting in standardisation of learning outcomes to ensure children's learning is thoroughly assessable (McLachlan, 2018). This trend in the West of standardising ECE curricula with the intention of creating more focused, formal versions of assessment is what Vygotsky and more recent philosophers have been arguing against (Lewis, 2017; Sutton-Smith, 1997; Vygotsky, 1967; Whitebread & O'Sullivan, 2012). Hence, nowadays many teachers have been trained to capture play in the form of a pedagogical imperative for assessment. Thus, play has been widely recommended as the pedagogy for learning in the early years, while at the same time teachers are made accountable for generating meanings that account for such learning. Thus, their articulations of what they can see in play, frame what constitutes learning.

Holst (2017) argues that in order to better understand play, it is necessary to resort to a deeper phenomenological analysis of what is occurring at the most basic level of play. When trying to attain new insights beyond the current understanding of how play might be examined, the solution needed to be a novel one that utilised current technological advancements to obtain new methods of research. The route of the researcher to such

access was through a metaphysical laboratory where teachers would be subjected to strong sensations that would touch their innermost persona by imparting new feelings and attitudes, as well as fostering a higher level of awareness. This approach offers an alternative lens of insight for participants, allowing them to perceive elusive conceptions of play in new ways. Such "seeing" disrupts the singular outlook on play from an *Enframed* view of play, as it enables a multiplicity of meanings that allow observers to see play through their own subjective perceptions.

Before the identified issues can be addressed, the context for this thesis needs to be set in this chapter by investigating the basic characteristics of play. This enables the development of a robust argument regarding the ways play is being captured and why this is concerning. Play is an extraordinarily broad concept; hence, when investigating it, it is necessary to study it from a distinct angle of interest. In this thesis, play is initially addressed in a somewhat broader sense; it focuses specifically on the early years context, as the empirical part of this study is applied to that setting.

Early childhood education consists of some crucial key experiences, activities, events, routines and interactions that are seen as integral for the development and learning of children attending an ECE service. In play-based curricula such as New Zealand's *Te Whāriki* (1996, 2017) this content is mediated to children through active play-based experiences, taking advantage of a number of different functions of play. The main issue play is facing in ECE stems from the way it is being framed for educational purposes by adult intentions and attitudes. Moulding play to serve the purposes of individuals or organisations does not require a lot of effort, as play is arguably easy to recognise but hard to define and hence vulnerable to misrepresentation and misinterpretation. This is seen through the requirements of teachers to notice, recognise and respond to learning through play, and in the way they are brought to account for their interpretations. Hence, understanding the notion of play as a phenomenon (a lived

experience) seen through the eyes of the player rather than as a mechanism through which learning might be grasped, holds potential for teacher interpretations.

There is evidence (McLachlan, 2018; Niles, 2015) that functions of play are somewhat unclear for many ECE teachers as even though their capability to facilitate successful play-based experiences is high, the articulation of how play supports learning and development is often vague and inconsistent. This difficulty is within the research scope of the thesis, as in practice it leads to several other problems that affect play. When teachers are unable to articulate play effectively to themselves, they are consequently unable to successfully defend the importance of free play when it is scrutinised by parents and policy makers; even more importantly, they may not be able to protect the right of the children to participate in unstructured play experiences, and children will be the losers.

Contributing to this interpretational deficiency of teachers are the same misconceptions and misinterpretations of play discussed earlier, such as the blurred lines between "learning through play" and "developing through play" accompanied by a lack of didactical teaching materials available to them through their training and professional learning and development opportunities (*Education Review*, 2015). The resources that are available are often as ambiguous as play itself and are lacking a focus on the basic functions of play (Johnson, 2017). The empirical part of this study will consider these implications also.

2.2. **The Importance of Play**

While play is commonly framed as containing many benefits for learning and development, it is important to determine how its functions prepare our young learners for the rapidly changing world.

2.2.1. Basic Features and Functions of Play

Theorist agree that children in the twenty-first century will need problem-solving skills and abilities in order to be competitive and productive adults (Holmes et al., 2015; M. A. Peters, 2010; M. A. Peters & Bulut, 2011) and therefore it is fundamental that ECE curricula have the capacity to incorporate the types of play that foster children's creative thinking and abilities. Creativity might be the most desirable skill to possess in contemporary environments (Holmes et al., 2015), as developing the full potential of creative thinking is beneficial for both the individual and society in the complex modern world (Sansanwal, 2014). Conceptualising divergent points of view while establishing new ideas should therefore take priority over specific learning outcomes when considering play. Holmes et al. further suggest that:

> In this view, skills involved in the creative process such as coming up with novel ideas, the ability to evaluate one's work, and discipline and control will be vital to successfully solving problems and unpredictability of a changing world. (2015, p. 1182)

While the importance of creativity for the economy is patently obvious to many, the importance of play is a lot less so, which is hard to conceive of, considering their intertwined nature. What is not so well understood, however, is that when time and space to play are being limited, the time and space to be creative are also being diminished, which was also exemplified in my personal reflection. According to Robinson (2010) our current education system and its curricula are repressing the natural development of creativity, its decline being especially evident after young learners spend a few years at school. Parallels can be drawn between the decline of creativity and play as the deteriorating trend is very similar. This again highlights the close relationship between play and creativity.

The capacity to experience joy in creative expression is the key ingredient in creative production, and play enables learners to do this while testing their internal and external

realities. Consequently, reinforcing creativity, imagination and divergent thinking seems to be one of the most vital functions of play. Providing children with open-ended flexible opportunities to express their talents and imagination and enhance their learning experiences (Holmes et al., 2015; Raphael-Leff, 2009; Russ, 2016; Sansanwal, 2014) is one of the most important focuses for the success of individuals in our society.

Developing divergent thinking is another significant function of play that enables successful lifelong learners. Divergent thinking is not the same as creativity but contributes to it because approaching problems from multiple angles is one of the components required for creativity. Therefore, many research papers focus on determining divergent thinking patterns in order to identify the level of creative thinking (Sansanwal, 2014) associated with pretend play and fantasy. Pretend play is widely researched, and it is commonly accepted that this kind of play fosters a range of functions that support learning.

Pretend play is a form of play that uses the child's perception of the world and fantasy to symbolise one object as another. Furthermore, symbolic play highly correlates with expressive and receptive language abilities, with strong links to creativity through creative speech (Whitebread & O'Sullivan, 2012). Creative speech boosts vocabulary acquisition through play and enhances an array of skills that support children's language (Lewis, 2017). Their emergent literacy ability in turn reinforces their creativity. Not only do these facts further affirm the interconnectedness of creativity and play, but they also link strongly to adult outcomes (Holmes et al., 2015, p. 1181), as children who participate in greater displays of expression and more elaborate fantasy continue to do so later in life (Sansanwal, 2014), with early creative play behaviours encouraging creativity in adolescence. Whitebread and O'Sullivan (2012) also suggest that play fosters self-regulation and social competence.

While some recent studies strongly suggest the importance of affect and cognition as functions of play, it is apparent that their relation to play is underrepresented in research

as well as in teachers' understanding. This supports my earlier reference to parents' misinterpretations of play: if all teachers were well versed in play theory they would be able to explain these links. Raphael-Leff (2009) presents a number of interesting discoveries about play in relation to the aforementioned under-representation. Play enables the child to frame and test hypotheses while becoming aware of realistic restrictions. Recently, affective processes have been seen as important in creative production (Russ, 2016), as the ability to think about ideas and images that connect emotion increases creativity, if this emotion is positive. Play is a supporting agent that helps children express and regulate their emotions (positive and negative) and provides them with the tools to feel, express and think about emotions. Similar cognitive and affective processes occur in pretend play and creative production, again affirming their interconnectedness (Russ, 2016). These findings reveal the complexities of play, and demonstrate why it is so difficult to interpret.

Raphael-Leff (2009) also talks about how the seriousness of play can be masked by fun and joy. She believes that play's seriousness pertains to the child's need to process through play the realities of this physical world, such as the realisation that the child is not omnipotent, that there are differences in gender and that mortality is a tragic truth. According to this theory, play becomes the principal means through which children can consolidate gender and generativity, while playing out their imaginative potentialities and generative anxieties. The role of the teacher is therefore of the utmost importance in supporting the child through these transitions in life.

These findings are particularly salient in contemporary times, as Parenta (2018) suggests, when an unprecedented number of young people, including children in their early years, are suffering from several cognitive afflictions and mental health disorders, such as anxieties, depression, stress, ADHD and schizophrenia among others. Outdoor play, which has been shown to increase life expectancy, might arguably provide a degree of counterbalance to young people's mental and emotional uncertainty.

Recent neuroscientific research shows that play contributes very significantly to the development of cognitive function (Holmes et al., 2015). During play, hormones released into the brain stimulate brain cell development and growth as well as building more connections between synapses. Neuronal growth is promoted by arousal of "play circuits" within the young brain, thus exercising and extending the range of behavioural options under the executive control of inborn emotional systems. It seems, then, that the rapid advances in neuroscience can undergird arguments for play, through providing scientific evidence for its benefits. Creating parallels between what teachers see in practice in terms of learning and development through play and what neuroscience is saying, should be an effective way of evidencing the importance of play.

Findings in neuroscience point to the fact that play may be the waking counterpart of dreaming – "a conscious dream presumably alluding to the processing of memories and unresolved experiences that occur through dreams," (Raphael-Leff, 2009, p. 22), as, if children are unable to take the time and space to play, they might not have sufficient processing capacity available to them to work through their unresolved experiences. This may result in certain mental deficiencies. In this regard, play research tools such as nonlinear interactional theory beckon to the likelihood that complexity of brain development parallels the increasing complexity of play (Whitebread & O'Sullivan, 2012).

This socio-emotional notion is further affirmed by the fact that psychological development is embedded in the social experiences of children when they use thought to regulate behaviour while mastering symbols and language. Leading activity, a neo-Vygotskian theory, suggests that a specific behaviour is initiated by a specific motive, where the developmental phases are characterised by a specific leading activity. However, as Whitebread & O'Sullivan (2012) point out, the danger here is that children's contribution to their own learning and development might be underestimated.

Play holds an important function in the development of social skills; specifically, pretend play even in its earlier forms is tied up with social interactions nurturing representational abilities and the understanding of the mental states of others. There is currently no consensus amongst theorists as to whether social pretence play is directly responsible for outcomes of increased social and cognitive maturity, but they all agree that it is a contributor to overall development (Whitebread & O'Sullivan, 2012).

In relation to holistic development, the cognitive and affective developmental domains are, through the neural system, closely linked with the physical body. The growth of bodily structures and functions in children is an important developmental domain that is being increasingly undervalued by adults. Play has an important role in physical development. The natural need for movement of children is best catered for through play as it positively impacts on their physical development through evolutionary mechanisms. All learning begins with the body and is in some way connected to movement, when sensory perceptions and critical pathways in the brain are established (Connell & McCarthy, 2014). In the early years movement is automated and regulated by play and seen as critical to the holistic development and learning of children. A physically well-developed child will have established automated movement in their neural pathways to free up the intentional functions of the brain for thinking and learning. Children learn concretely by experiencing through the body before they can structure abstract concepts. Recent studies in the west including in New Zealand warn that the physical domain of child development is rapidly losing its importance in the minds of adults, with the achievement of standardised academic outcomes being prioritised in the classroom (Sevimli-Celik, 2017). Sevimli-Celik (2017) also argues that in the early years of formal education the mind's potential rather than that of the body is over-emphasised, and this constitutes biases against physical expressiveness, creativity and playfulness. It is also suggested that there should be a stronger emphasis on teacher education programmes that support pedagogical knowledge to shape "playful strategies and movement principles of learning," (p. 130).

2.2.2. **Learning and Pedagogy**

In the current context of early childhood education, play and learning are almost synonymous in curriculum terms, even though as a concept "learning through play" has not yet been established by empirical evidence (Whitebread & O'Sullivan, 2012). The progressivist ideology of play and its discourses have been well established in adult minds and with those beliefs so have educational practices (Sutton-Smith, 1997). While western curriculum documents confidently assert that play should be "used" as a vehicle to achieve its learning outcomes, the actual academic theory about how adults should engage in child-initiative play in the field of ECE is permeated with ambiguity (Stover et al., 2010). The research on adult involvement in play is inconclusive, pointing to both positive and negative potential of adult intervention (Epstein, 2007). Contemporary learning theories such as Vygotskian and Neo-Vygotskyan suggest a broad and integrated approach to pedagogy where the adult involvement should be sensitive in its nature as it can enhance developmental outcomes if the ownership of play stays with the children (Whitebread & O'Sullivan, 2012). In such engagements children would be setting their own "zone of proximal development" by setting their own level of challenges (Vygotsky, 1967). Children's feelings of control combined with the provision of emotional warmth and security will enable effective cognitive challenges and stimulate their development.

Play is not only being used as a tool for education; adults are also determining which kinds of play are "good play" and which are "bad play". Pretend and socio-dramatic forms of play are favoured as they appear to benefit the learning while little latitude is given to rough and tumble (R&T), physical and war play. An adult desire to organise children's free time in every possible way (Sutton-Smith, 1997) blinds them to the fact that children still get benefits from, and that they enjoy, the kinds of play adults may disagree with. They often exert their power and control over children by limiting opportunities for unstructured non-adult supervised play (Lewis, 2017). For play to

stop in its natural course, submerged in its rhythm to-and-fro, something has to block it from continuing to unfold itself (Holst, 2017). Usually the obstructions are rules forged by adults. Play at its most elemental is not bound up with, but rather free of, fixed, prescribed rules. There may be rules while playing but they are set by the players and can only be changed by them as desired.

A number of studies suggest that more teacher play training is needed in playful approaches, designing play environments and pedagogical decisions, techniques and strategies involving play (Lewis, 2017; Sevimli-Celik, 2017; Whitebread & O'Sullivan, 2012). When teachers are able to understand that play naturally encompasses all educational learning and development, not just the predetermined academic learning outcomes, they might start to value play as a self-actualising learning tool (Connell & McCarthy, 2014).

The above literature review presents the first part of the paradox of play that I am presenting in this thesis: the importance play has on the natural development of children into adults. This brief theoretical examination of play as learning in ECE and the pedagogical emphasis of play in the sector sets the scene for the next chapter and the second part of the argument, which examines ways in which play is being framed by adults, educational organisations, curricula and even media in ways that do not align with the rudimentary properties and functions of play. A thorough investigation of these notions will further develop my argument for why a novel approach to examining play is needed.

3. The Looking Glass of Play in Policy and Research

Following the investigation of the importance of play for human development, this chapter will present the main issue this thesis will address, namely the fact that play is being captured by numerous stakeholders of play in ways that defy its basic nature and function. Firstly, I will explore some metaphysical characteristics of play that will demonstrate how play reveals itself to us and how we see it, by delineating play with notions such as *technē*, ground and *poiesis* Next, I will examine possible reasons why play is so vulnerable to disparate interpretations, discourses, ideologues and rhetorics of play, by examining the philosophical notion of *Enframing* and relating it to play. Following this, I will discuss the different ways play is being framed in the contemporary western world and outline the main challenges facing researchers endeavouring to examine play. Being as play will examined at the end this chapter, which will provide for a fluid transition into chapter 4.

3.1. The Question Concerning Play

Play is widely regarded as being universal, broadly identifiable, but very difficult to explicate and, as a consequence, generally perceived as an elusive term which defies all conceptualization (Lewis, 2017). These challenges of the multifacetedness of play are also reflected in the educational practice as Whitebread and O'Sullivan (2012) note: "The field of early childhood education is permeated with ambiguity around how adults should engage in child-initiated play" (p. 207). One of the predominant explanations of this problem is rooted in Piagetian child-centred philosophy that views play in a progressivist way, arguing that it supports stage by stage temporal development. Even though this view has been largely criticised, it is still embedded in a contemporary ideology of play. Ohaneson (2017) advocates that in order to transcend the current rhetorics of play, a stronger philosophical perspective on play must be engaged with. When theorists attempt to frame play within a defined construct, they often use broad

terms such as heterogenous, ambiguous, elusive, dynamic, multifaceted. There is no doubt that conceptualizing play presents a conundrum. Some theorists, however, suggest that the act of framing play or as Vygotsky says "intellectualising" it is what renders it ambiguous (Connery et al., 2010).

The fact that theoretically determining play seems to be a futile endeavour and that play cannot be tied down by one possible explanation or definition perhaps becomes clearer if we view play as a phenomenon that receives its impulses from life itself (Holst, 2017), as suggested in my reflection in the introduction. If life arguably should not be considered an object, then perhaps the same standard should apply to play:

> Articulating a definition of play is extraordinarily difficult: first, because play is abstract and fluid; there is an absence of object, action or place; second, because play is possessed with a multiplicity of meanings. Together the multidimensionality and fluidity of play make it challenging to explicate play; almost any pursuit or act could be play simply by how we frame it. (Johnson, Christie, & Wardle, 2005, p. 11)

When play is to be framed it is in most cases regarded as an object and when play is gazed upon as an object it becomes an illusion of itself and it takes a ludic form for the eye of the beholder (Larsen, 2015) - ludic in the sense of a careless act of following playful impulses that exhibit no apparent reasoning and meaning (Merriam-Webster Dictionary, 2018). The philosophical dilemma that arises from this thinking is complicated by the issue of how play can be described rationally and scientifically if not as an object (Holst, 2017).

The fact that scientists, researchers, and policy-makers in education describe play according to their own perception, ideology or rhetoric of play, is of great importance to this thesis, as it supports the argument that the diversity of emergent contemporary discourses of play can be reduced to a simplistic version of play that leaves it vulnerable to abuse. Elusiveness – a defining feature of play - becomes its Achilles' heel, making

it susceptible to its own erosion. Perhaps as suggested before, a further philosophical examination of this perplexing problem can give rise to its solution.

3.1.1. The Play Frame

Several early childhood researchers have noted and tried to explain the boundary that separates player from onlookers. Brooker (2011) stresses that researchers should start listening to and observing children as they play in order to take children's own perspectives on/of play more seriously - in other words, they should source the information about play from the players, who operate under the illusionary blanket and beyond the elusiveness of play: 'If educators and researchers ignore children's own play agendas, and focus on their own, they will be unable to support the important meanings play holds for children' (p. 142). A Dutch philosopher (Huizinga, 2004) says that play creates borders where time and space act differently from those of the world outside. From this perspective it is as if the beholder were looking at a time-space aberration and struggling to work out what is happening.

This raises the question of what this blanket, border, or frame between the observer and the children at play is, and how it comes into existence. Ironically some researchers who are examining the mechanics of play (Butler, 2010; Lewis, 2017; Whitebread & O'Sullivan, 2012) have named the boarder the "play frame", as *Enframing* play has been attempted numerous times, yet the possibility that play might be framing itself has not been considered. Like a protective shell, this self-established frame reflects back the gaze of observers in their own incomprehension. It becomes a boundary between real and imaginary where children can realize their freedom, joy and passion (Vandenberg, 2004, p. 58). The play is established within the play frame when children commence playing and the rules for membership within it are set. These rules are either mediated through play itself or discussed and set outside the play frame. Then the context adaptation rules are activated and co-players' transformations of meanings are implicitly incorporated (Branco, 2005). Continuing from this, collective pretence

commences. The players freely step inside and outside the play frame when required. For example, if rules are not abided by, the player steps out of the play frame into the seriousness of the real world to resolve the conflict and once the conflict has been resolved the pretence resumes and the player steps back into the play frame, unless conflict becomes the theme of the play. Observers are able to establish whether players are inside or outside the play frame by monitoring the communication that occurs (Sawyer, 1997). The communication outside the play frame will be explicit as the child becomes the director of play while thematic rules are established or amended, or as mentioned conflicts resulting from different perceptions of the themes or roles in the play scenarios are being resolved; inside the play frame the player's language becomes implicit when the child becomes an actor of play in character. If a child is playing alone the need to leave the play frame is infrequent. Understanding these exchanges in play is vital if observers are to comprehend the elusive nature of play.

Observers can experience the play frame and, more importantly, they can enter it if they so desire by assuming a character and by adopting the implicit language style. By understanding that play is an unnatural freedom established by the rules and constraints that become internal to play (Ohaneson, 2017) observers can become participants. Play plays out through the participants (Larsen, 2015); hence, its true nature is only revealed to the participants. Once researchers take these facts into account, they will see the dynamics of play more clearly. These findings are fundamental to this thesis's aim to support observers to reconceptualise play beyond its elusive nature, as they set the key imperative that adults need to comprehend: that in play something gets exposed, players themselves get exposed too, but they may not realise it (Holst, 2017).

Due to the identified need for a more philosophical, phenomenological and metaphysical investigation of the complexities of play, this chapter will interrogate several notions that pertain to the elusive, ambiguous, ludic and illusory properties that provide such challenges for "seeing", investigating, researching and learning about the

basic features and dynamics of play, outside its framed state. Play seems to be unpredictable when regarded by an observer as, while it may reveal something about itself, there will always be more that is being withheld. This ambiguity of play is especially prevalent for non-engaged observers, as play protects itself against such onlookers with a metaphysical border that renders it incomprehensible.

It is necessary to interrogate in more detail the attitude towards the world that underpins the notion of framing, to understand the status of play in the contemporary Western world and to be able to discern the ways play is being framed. As I am proposing a metaphysical laboratory to examine play in, this philosophical examination of framing will have a metaphysical component and will include the wisdom of several thinkers, that have dealt with this topic.

3.1.2. The Metaphysics of *Enframing*

The notion of framing was the subject of philosophical discussion for several theorists; however, the most noteworthy in relation to the phenomenological paradigm of this thesis is Martin Heidegger. While the thinking of other philosophers is also going to be considered, I have decided to interrogate Heidegger's notion of *Enframing* (*Gestell*) the most intensively, for several reasons. Firstly, Heidegger related his concept to technology, which figures strongly in this thesis. Including his philosophy in a thesis that endorses an empirical research project using technology might be considered somewhat perilous, but I will explain why I believe that even though Heidegger would have been fundamentally highly critical of the direction the technological society is taking us, he might have endorsed my research effort. Secondly, as I mentioned in the introduction, I have always mused on the connection between play and life. Heidegger's philosophy throws light on this connection, and additionally supports the elaboration of a specific attitude towards play that enables the persistence of the issue

of framing play. Furthermore, Heidegger concerns himself with phenomenology, which is the theoretical paradigm this thesis is set in. He is also closely linked to two other theorists who feature heavily in this thesis - Edmund Husserl, whose student he was, and Michael Heim who is a follower of Heideggerian philosophy.

As Heidegger's explanation of *Enframing* relies heavily on a particular understanding of technology, it would be difficult not to talk about it in this section. I am hence relating his example of *Enframing* of technology to mine regarding framing of play. I would also like to alert the reader to the fact that Heidegger's views on technology are of pivotal importance for a later chapter of the thesis also.

Heidegger affirmed the importance of technology, but he also warned of its dangers. While the cartesian outlook regards it as a neutral tool for human use, Heidegger suggest it has a substantial value bias and that through this bias transforms what it is to be human (Fitzsimons, 2002). Heidegger claims that modern technology has fostered the modern mindset due to the inception of what he calls *Gestell*, usually translated as *Enframing*. This mindset blinds people to what Heidegger refers to as the "essence" of technology, where essence is the manner in which technology comes to presence (Heidegger, 1996). How we do things technologically determines our identity. The paramount problem as he sees it is that "the essence of modern technology" (p. 7) establishes a new cultural system that casts the whole social world as an object of control. In this new assemblage, humans lose contact with all that which cannot be calculated; those things retreat into the elusive, and the world seems a scene of loss, without meaning and transcendence; Being is seen as something represented (*vorgestellt*) and manifested visually so as to be made available for manipulation and domination by a subjective will (Ruin, 2012). As Being is deemed as something represented, it is consequently also being objectified. I suggest that the same is happening to contemporary play.

Heidegger's (1996) essay "The Question Concerning Technology" addresses a dehumanized darkening of the world, where human agency is being reduced, or perhaps even extinguished by modern technology subjugating people to its own essence. A paradox arises where the more we make use of technology, the less life is under our control, as control is being relinquished to technology itself.

So, what does this have to do with play? Heidegger contends that technology is difficult to explain as an idea and questions about it often elude us because technology is usually interpreted anthropologically or as an instrumental tool to realise the needs of humans. He refers to this kind of explanation of technology as misleading as it unnecessarily limits our thinking. Heidegger's Question Concerning Technology is not unlike my Question Concerning Play, because both technology and play have increasingly more become the subject of *Enframing.*

Heidegger's (1996) definition of "essence" of phenomena corelates to what I have been referring to as the basic properties and functions of play, or as he might put it the way play reveals itself to us. Play also seems to elude an explanation and if we follow Heidegger's premise, we might conclude that this might be due to the theoretical examining of play being limited to its usefulness for achieving standardised and ordered learning outcomes; both technology and play become objects of instrumental thinking, where their essences do not matter, but merely their usefulness towards human ends. This "single-minded focus on ends is a sinister phenomenon of modern life" (Fitzsimons, 2002, p. 142). Regarding play, I cannot help but relate this 'sinister phenomenon of modern life' to what Vygotsky referred to as a "terrible intellectualisation of play". Vygotsky cautioned us to stay true to the "essence" of play as if we "refuse to approach the problem of play from the standpoint of fulfilment of the child's needs, his incentives to act, and his affective aspirations would result in a terrible intellectualization of play," (Lewis, 2017, p. 21). I see the fulfilment of the

child's needs and aspirations here as a refence to the essence of play, where play is left to run its course to fulfil its basic function through its basic features.

It seems that Vygotsky makes the same suggestions as Heidegger did in relation to technology, as he contends that the way to address this danger is not through a further development of technology, but rather in realising that the problem is concerned with the *Enframing* that sets up the circumstances that blind us to that risk (Fitzsimons, 2002). I am arguing that Vygotsky's 'intellectualisation' is a manifestation of the *Enframing* of play; however, Vygotsky does not address the issue from a metaphysical perspective, while Heidegger does. Heidegger continues that from his point of view the problem does not lie with technology, but instead with our thought, as it is *Enframing* that stops us from seeing what we are doing. As I continue to draw parallels to play, I would like to note that perhaps, then, the elusiveness of play does not originate from play itself, but instead from the way we think about play, our attitudes towards play. This point is crucial to this thesis, as it highlights the importance of adult attitudes towards play and warrants my proposing an empirical investigation of adults' attitudes towards play and how these might change when play is experienced beyond the limitations of *Enframing*.

Heidegger goes on to investigate the causality of *Enframing* by referring to Aristotle's four causes. He connotes that identifying causes may be very difficult as, there may be many circumstances that we are unaware of; and he implies that due to the complexity of the world we might not ever know what causes what in certain circumstances. This draws further connections to the ambiguity of play, as play is seen as a highly complex phenomenon with many circumstances that we are potentially unaware of, or unable to learn about. Furthermore, due to human nature we may naturally allocate a cause to an effect, even when unwarranted. Perhaps the supposed link between play and adult-led learning is one such case. Heidegger noted that when technology and broadly most things in our contemporary world are being appraised they tend to be seen through just

one of the four causes: that is, the efficient cause (*causa efficiens*), focusing on what the technology can do for us, whether it is meeting our ends, as noted before. The same can be said about play and the narrow progressivist framing focused on play as a tool for learning, with Maria Montessori going as far as calling it "work". Heidegger (1996) makes us aware of the limits of our understanding, in that such *Enframing* denies human agency in which the means can also be a cause, and stresses that there is more to important life events than rational human control, because efficiency does not value the cultural signification that gives meaning.

To overcome this problem of causality the philosopher suggests including the four modes of occasioning within it. By gradually investigating what the phenomenon currently only represented as means actually is, then revealing (bringing forth) can be reached. According to Heidegger, technology itself then becomes a means to revealing (Fitzsimons, 2002) and, analogously, playing becomes the means to reveal play. We should then not be asking questions about how play can support learning, but instead focus on a phenomenological investigation of what play is, which is something that other theorists besides myself have also suggested (Lewis, 2017; Marjanovic-Shane & White, 2014; Whitebread & O'Sullivan, 2012). Heidegger adds that in the current system of thought there is no space for self-revealing to take place, as any sign of divergence is quickly corrected by the system and brough back to the *causa efficiens*. Such knowing provides an opening up, "a revealing" (Heidegger, 1996, p. 3) and, in terms of revealing, technology can be a way we get to know this world. It is due to this affirmation that I believe Heidegger would have not objected to my proposed use of technology, whereby I am endeavouring to reveal play using VR. This is a very different way of applying technology, and does not regard nature as simply stored output to be used as a standing reserve. VR users would still retain a great deal of mystery that enables a multiplicity of different viewpoints on phenomena. This kind of approach would allow them to connect with understandings beyond rational human knowledge, by the kind of joy VR can give rise to. Hodge (2015) adds that according

to Heidegger "shifting the meaning of technology (or instrumentality) from 'means' to way of revealing is to invite us to consider our fascination with technology and faith in technical solutions as ways of experiencing Being" (p. 26). Heidegger is rejecting the common approach to this question, by not simply asking what technology is, but instead asking how technology can lead to truth. The question then changes from the truth about technology to accessing the truth of and by technology, which I hope VR can make possible regarding play. Furthermore, immersive video as a form of VR might also be considered artistic in character and, according to Heidegger, the being of the artwork cannot be grasped on the model of objective entities as present-at-hand, nor can it be comprehended according to the model of the tool as something ready-to-hand (Ruin, 2012). I will look further into art and play below.

The way Heidegger explicates modern technology suggests that in order to be able to understand it, we would need to know the framework as a whole, but as people are part of the framework itself it remains persistently hidden from them. In contrast to how technology was regarded in ancient time, it is now demonstrated through "challenging," or "demanding from," nature, where previously it was revealed through "bringing forth" that which is within nature. I can again correlate this to play and suggest that the bringing forth of what is in the nature of play, can only be achieved when play is 'free' from adults demanding that play teaches and produces learning outcomes. Consequently, it could be argued that it is through free play that play reveals itself naturally, or as Whitebread and O'Sullivan (2012) suggest, play can only be understood when observers become part of the dynamics of play. When play is *Enframed*, observers are compelled to consider everything in the same way, as standing reserve; anything else that may be inclined to reveal itself is not allowed to appear. For example, play is limited by standardisation of learning outcomes that are to be achieved through it being conceived of as standing reserve. The play-based curriculum is hence only allowed to be interpreted through this one dimension – the learning outcomes. Under this obligation, things are not observed as objects as their importance is limited to their

readiness for human control and they do not exist for their own sake (Fitzsimons, 2002), as *Gestell* is an active framework that both constitutes and institutes order. This unrelentless drive for production in education derives from the industrial revolution, as it facilitated the factory model that is still reflected in our current education system. This system endorses the flow of *Enframing*, as it is focused on order for its own sake as "everywhere everything is ordered to stand by, to be immediately at hand, indeed to stand there just so that it may be on call for a further ordering" (Heidegger, 1996, p. 17). Here everything is being treated as a resource that needs to conform to ever-increasing order and nature has been reduced to a system of information. However, the objectified world of calculable things as characterised by natural science is actually a secondary phenomenon that arises out of the more original lived world as its theoretically mediated modification (Ruin, 2012).

In an *Enframed* system the subject becomes the object in order to become part of it, and hence Heidegger argued that subject and object collapse. If I were to suggest that, in the process of being educated, children are reduced to objects, I might face serious criticism, perhaps generated by the system itself to restrict such thinking; however, if Heidegger's thinking is applied to the dynamics of play, the assertion is valid, as when adults order the system to produce learning outcomes, all focus is on the outcomes and not on the children. As in the *Enframed* system, play and children are regarded as objects. With children being denied their human subjectivity, they become a resource for achieving the goal of the system, and lose their human agency (Fitzsimons, 2002).

Enframing presents itself as the only view, the only possible outcome of the system, and its intolerance to other views becomes its defining characteristic. It then imbues play with ambiguity and renders it elusive. Hence play comes forth in the form in which it is being summoned, as a progressivist tool for learning; it never includes *Enframing* itself, but *Enframing* instead remains hidden. Fitzsimons (2002) agrees, as he relates Heidigger's *Enframing* to Education: "In *Enframed* education there must be continual

supply and constant improvement in value. “Extraction,” “provocation,” “forcing out,” are the modern ways of revealing. Any tendency towards self-emergence is thus overruled and absorbed into forced production,” (p. 153). Heidegger (1996) delineates modern technology as a setting-upon that challenges the energies of nature as an expenditure by unlocking and stockpiling it to be used. Fitzsimons (2002) applies this concept to Education as an educational framework for constituting and instituting order (*Gestell*), that demands, sets upon, engages, but does not allow for any other kind of revealing. The claims of such a system draw on a constant supply of resources such as knowledge, people and financial capital assets.

Heidegger also notes that a world imprinted by technology is also a world branded by a forgetfulness of being and he urges us to meditate on the significance and effects of that forgetting (Ruin, 2012). But Heidegger’s remedy for this situation is not to avert it, but instead to confront it philosophically through a new mode of inquiry and listening, through a “poetic questioning” and a “thoughtful meditation” (*Besinnung*). This does not occur as a definite measure, but as something towards which we can develop a freer relation to, by listening to it as a freeing claim (*Anspruch*). He sees this as a resistance to *Enframing* through a return to nature (earth), by giving attention to what remains of the diverse, the local, and the unruly in our current practices. He suggests a move towards *poiesis*, as an alternative understanding of Being, as it as an ontology allows alternatives. When *Enframing* is active there is no mystery and nothing is sacred, not even child’s play. Yet, this is hidden from us, as *Enframing* blocks *poiesis* (Fitzsimons, 2002). *Poiesis* allows for the idea that life is ultimately a mystery. Hence, the task is to build a way toward the phenomenon through language that will lead to new ways of thinking, a relation that Heidegger clearly describes as “free” (Ruin, 2012). Hence to think about it through the lens of the *Gestell* is thus to make us freer. Thinking about play will support more free play and will make educators and learners freer. And while it is hard in this enclosed system to see a place for the ancient *poeisis* or the emergence of completely new ways of revealing (Hodge, 2015), I will endeavour to

find one such way through applying technology thoughtfully in this research, as Heidegger's point is that technology also contains new possibilities:

> In the obvious danger inherent in contemporary technologically defined modernity, there also lies a saving potential. In his later writings Heidegger would often quote the lines from Hölderlin's " Patmos", "But where danger is, grows the saving power also". In the essay on technology this holds a very special place, for it also summarizes the way in which he wants *Ge-stell* to be understood, namely as an "ambiguous" situation of (manifest) danger and (potential) saving at once. (Ruin, 2012, p. 193)

3.2. *Enframing* of Play

The elusive nature of play has undermined play due to a limited understanding of it by influential decision-makers in education in the western world. Due to the inherent ambiguousness in play-based curricula many are finding it hard to assess learning outcomes derived from free play (Blaiklock, 2010; Niles, 2015), resulting in play becoming increasingly intellectualised and its outcomes further standardised. Lewis (2017) argues that one of the basic functions of human development is being eroded globally and nationally through this capture of play.

The *Enframing* of play makes it ambiguous, then, and it becomes its own vulnerability: it reveals itself as something controllable and manageable by any agent that sits outside it. It can then be reimagined for parents, teachers, children, educational policy makers and communities in ways that do not reflect its true nature. This state of play has enabled a number of neo-liberal discourses to realise their agendas by framing play through mechanisms such as commercialisation (Lewis, 2017). This means that learning more about the nature of play is important not only for teachers but also for parents, so that they can protect their children's developmental right for free play untainted by the agendas of adults (Jarvis et al., 2014). Hence, if there were easier,

more accessible ways for people to understand the multi-facetedness of play, political and commercial forces would presumably find it much harder to manipulate it.

3.2.1. *Enframing* Play in the Curriculum

The current enthusiasm for standardized testing in the western world and the willingness to mould curricula to serve this agenda is irreconcilable with any ECE philosophy. The incidence of such testing has risen in the shadow of neo-liberal discourses that frame play merely as a teaching tool, and hence inadvertently contribute to the intellectualisation of play (Fuller et al., 2007). This, and accompanied standardised learning outcomes, are causing an erosion of play. Recent educational and early childhood reforms globally are establishing an elaborate focus on systematisation and standardisation of early childhood settings through prescriptive and school orientated explanations of learning, with a powerful emphasis on outcomes and standardised assessments (Westbrook & Hunkin, 2020). Such schoolification and datafication of pedagogy in the early learning context endangers the role and importance of play by marginalising its value and framing it within an accountability focused policy regime. From the perspective of a Heideggerian critique this would denote play as a standing reserve (Heidegger, 1996) that needs to be ready to be exploited when ordered.

To forefront how play is currently being framed in the curriculum, a review of key factors that affect free play are considered next. Table 1 shows a comparative analysis of ECE curricular documents from six western countries. Based on the content, direction and discourses identified in governmental curricula documents, the following factors are considered: based on play theory, relation between play and learning, a presence of the school-ready and ready-for-life agenda, level of guidance, holistic and progressivism focus, academic outcomes agenda and inclusion of standardised outcomes.

Document name	Year	Country of Origin	Age group	Play based curriculum	Learning VS play	School ready agenda	Ready for life agenda	Prescriptive / Guiding	Holistic / Progressivist	Academic outcomes: Reading, writing and maths	Assessing standardised outcomes
Te Whāriki	2017	New Zealand	0-5	Yes	Learning and play seen as equal	yes	yes	Guiding	Holistic	Pre-writing, pre-maths	Somewhat focused
(ELOF) Head Start Early Learning Outcomes Framework	2015	USA	0-5	Somewhat	Stronger focus on learning	yes	yes	Prescriptive	Progressivist	Knows and uses numbers & letters	Strong focus
Statutory framework for the early year's foundation stage	2017	UK	0-5	Somewhat	Stronger focus on learning	yes	yes	Prescriptive	Progressivist	Knows and uses numbers & letters	Strong Focus
Navigating the Early Years: An Early Childhood Learning Framework	2019	Canada	0-8	Yes	Stronger focus on learning	yes	yes	Guiding	Holistic and Progressivist elements	Knows and uses numbers & letters	Somewhat focused
Curriculum for Kindergartens (Kurikulum za vrtce)	1999	Slovenia	1-6	Yes	Seen as equal	yes	yes	Prescriptive	Holistic and Progressivist elements	Pre-writing, pre-maths	Somewhat focused
(EYLF) The Early Years Learning Framework for Australia: Belonging, Being and Becoming	2009	Australia	1-5	Yes	Stronger focus on learning Play-based learning	yes	yes	Guiding	Holistic	Pre-writing, pre-maths	Somewhat focused

Table 1: World Curricula Document analysis

The documents analysed are *Te Whāriki* (Ministry of Education, 2017) from New Zealand, *Head Start Early Learning Outcomes Framework* (Administration for Children and Families, 2015) from USA, *Statutory framework for the early years*

foundation stage (Department for Education, 2017) from UK, *Navigating the Early Years* (Education and Early Childhood Development, 2019) from Canada, *Kurikulum za vrtce* (Kranjc, 1999) from Slovenia and *The Early Years Learning Framework for Australia* (Department of Education, Employment and Workplace Relations, 2009) from Australia. I have chosen some of the most influential curricula documents and the ones that I have worked with and had exposure to. It can be seen that most of the documents refer to themselves as explicitly as play-based curricula, excluding the UK and the USA curricula, though these still refer to play as an important tool for learning. Most documents assert their privileging of learning over play and use play almost as a synonym for learning, except for *Te Whāriki* and the Slovene curriculum documents, which use language that specifies play and learning as equal and distinct entities. None of the documents shy away from explicitly stating in their purpose a school-ready and a ready-for-life agenda. The New Zealand, Australian and Canadian ECE curricula are set out to be guiding documents that support and steer the decisions of teachers, while the UK, USA and Slovene documents are specifically mandated to be used in a particular way. Two of the analysed documents are strongly holistic (New Zealand and Australian), two are predominantly progressivist (USA and UK) and two foster equal aspects from both elements. The expectations for academic achievements in terms of literacy and numeracy also differ between countries. While the US, UK and Canadian documents expect children to know and use letters and numbers, New Zealand, Australia and Slovenia are more focused on preliteracy and pre-numeric skills that do not explicitly require children to write and use numbers before school.

It can be seen that curricular frameworks (UK, USA, NZ) acknowledge the value of play at a theoretical level; yet implementing an effective pedagogy of play can be problematic (Lewis, 2017; Whitebread & O'Sullivan, 2012). This may be due to the concept of "learning through play" being enshrined in these documents even though the research that there even is such a notion as "learning through play" is quite inconclusive. Learning through play often misleadingly claims the benefits of play for

the development of young humans, with many well-researched, supported functions of play in the scholarly community. Yet while the rhetoric of play is alive, play itself has become highly structured, included under the gradual standardisation of ECE curricular documents to ensure there are learning goals to be met (Sevimli-Celik, 2017). This means the authenticity of play has been undermined, because authentic play requires the absence of any adult unless the adult is a co-player and the goals of play remain with the children. Hence in many countries play has become institutionalised in ECE (Lewis, 2017). This is reflective of the Cartesian outlook and approach that still has a strong hold on people's minds (Holst, 2017). Seen from a strict scientific and analytical point of view, ludic activity appears irrational and meaningless: hence, play needs to be rationalised and institutionalised for it to take on a meaning that caters for the current rhetoric of play. Again, a link can be drawn between the ambiguity of play and its erosion:

> It is often a curricular play script created and grounded in Euro-American norms, implemented and orchestrated by adults armed with a deep belief that manufactured play, that is, play with a purpose and learning objectives, is essential to children's development; always under the watchful gaze of the teacher; and always argued to be facilitating literacy and numeracy development. (Lewis, 2017, p. 18)

Te Whāriki (MoE, 1996) has been a widely celebrated document nationally and internationally for its ingenuity, openness and the ability to be applied to any cultural context due to its positioning in the socio-cultural paradigm and the bicultural environment of Aotearoa (Peters et al., 2010; Stover, White, & Rockel, 2010; White, 2016). While its philosophy of openness was celebrated by many (Novak, 2013), this same philosophy was used against it when the document was scrutinised by some academics such as Blaiklock (2010). The curriculum alongside its suggested framework for assessment (Carr & Lee, 2012) was seen by some as too open to successfully evidence the success of progressing learning and achieving learning outcomes (Blaiklock, 2010, 2013). The curriculum included 127 possible learning

outcomes that the teachers could work towards, giving them a range of possibilities of how to articulate learning that occurred in free play experiences. Critics suggested that there were too many goals and that the applications of the curriculum in the context of free play were too wide to measure its success, thus revealing neo-liberal agendas. Hence the 2017 update of the curriculum (MoE, 2017) standardised the learning outcomes of the document to 26, with a stronger neo-liberal focus on 'School Readiness' (Haggerty & Loveridge, 2017). This lifelong learning agenda reinterprets early childhood education as a preparation stage for school and frames academic needs for the desired human capital outcomes of early years programs. The initial draft included statements about learning letters and numbers and was not received well by many in the ECE community during the very short consultation period. The final draft amended the wording; however, the outcomes still retained a certain amount of implicit academic learning that was to be acquired through play, revealing an intellectualisation of play.

In their recent critical discourse analysis of the Australian and New Zealand national early childhood curricula frameworks, Westbrook and Hunkin (2020) have examined the treatment of play and learning as they relate to one another and investigated how the discourses of Westernised ideologies such as neoliberalism have influenced the *Enframing* of play as a learning tool. They have found that the aforementioned New Zealand ECE curriculum document update caused some tension within the sector, due to a rewrite that underscores the institutionalisation of children and reduction of children's rights to quality education and due to *Te Whāriki* (Ministry of Education, 2017) being subjected to an economic agenda with a competitive discourse. The main causes for critics' concern can be observed in the shift towards formalising and systematising the curriculum content, with a focus on academic ideologies of learning, and the achievement of predetermined and quantifiable skills, knowledge and outcomes.

Through their discourse analysis Westbrook and Hunkin (2020) found that the Australian curriculum document promotes neoliberal education discourses by denoting

early childhood education as learning, teaching and educating, in contrast to some of the historically more dominant focus on education, care and development. Not unlike their Australian counterpart, New Zealand promotes in their revised curriculum *Te Whāriki* (Ministry of Education, 2017) a stronger emphasis on assessment and intentional teaching. This raises concerns about a move away from enabling child led play for the purpose of didactic teaching. These changes in the power dynamics surfaced because of a focus on lifelong learning, which encourages a shift away from values of learning through play toward intentional learning activities that prepare young learners for the next stage in their education.

In both the Australian and the New Zealand documents, the prevailing view is that the learning of children is being activated by play, assigning play a powerful role as an apparent subject that acts on learning by enabling the achievement of academic prescribed learning outcomes and goals. However, as noted before, such links are a matter of unsubstantiated claims, ungrounded in empirical research. The documents also include descriptions of how play is an active factor in enabling learning and recognised as an enforcer of academic learning, that underpins a lifelong learning ideology that comes to life within the dynamic process between play and learning (Westbrook & Hunkin, 2020). This considerable power attributed to play as an agent for learning contrasts sharply with how little is understood of its effects on learning. In comparing the two curriculum documents the authors have also identified some key differences between the levels of power the neoliberal discourses have ascribed to the learning-through-play agenda. The authors noted that *Te Whāriki* (Ministry of Education, 2017) assumed children with more agency in play and their learning processes than did the Australian curriculum EYLF (Department of Education, Employment and Workplace Relations, 2009) as the role of the adult was portrayed in a less invasive way and child agency was granted more respect than in the latter document.

3.2.2. Capturing Play as Tool for Assessment in ECE

As shown above the expectations for teachers set by most curricula documents require them to assess progression of specific standardised learning outcomes in their learners. While the rhetoric about free play persists, assessment requirements negate this by ascribing a specific purpose to play that counterintuitively marginalises play as a neoliberal tool for achieving standardised learning outcomes. The curriculum mandates assessment, and assessment mandates teachers to primarily focus on learning when considering play. This establishes a power imbalance between play and learning.

Assessment is perhaps the most powerful policy tool in education (Carr & Lee, 2012). A simple definition of assessment in Education is offered by Alcock (1998) as being a process of documenting a person's progress in their development and learning. It can be used to not only recognise strengths and weaknesses of individuals, institutions and whole systems of education, but also as a powerful source of leverage to bring about change (Carr, 2001). This aspect of assessment is of outmost importance for the progress and evolvement of global educational policies, especially in this era of knowledge economy (Peters, 2010). However, theorists agree that assessment brings with it a range of complications and it seems to carry a negative undertone and some confusion because of the contested nature of the term (Makin et al., 2006).

Carr (2001) argues that for assessment to be a successful tool it needs to have strong philosophical underpinnings in its purpose, outcomes of interest, focus for intervention, validity, progress, procedures and value to practitioners. These criteria are often applied to school curricula founded on academic learning and then merely transposed in simplified forms to ECE curricula, often with little regard to the way children learn and develop at this age – through play. The study of Kim, et al., (2006) provided empirical evidence that the way teachers educate learners in public education systems is very good at encouraging a particular type of rote, convergent and linear thinking that encompass activities such as memorisation, multiple choice selection and

repetition; but it is extraordinary detrimental in its understanding, let alone nurturing of innovation and creativity, that develop through play. This confirms that often, even when play is advertised in ECE curricula policy documents, it is actually regarded as merely a tool to achieve prescribed outcomes that feature a lot more prominently, ignoring the basic purpose and nature of play itself (Holst, 2017; Lewis, 2017; Whitebread & O'Sullivan, 2012).

Countries around the world are continuing to put more weight on formal types of standardised assessment in ECE. With the rise of these policy imperatives, the demand for teachers to frame play as a tool for assessment continue to rise. This call for a more comprehensive approach to assessment and planning in early childhood education is also being raised by some in New Zealand (Ministry of Education, 2015; Education Review Office, 2013; Zhang, 2015). Online social media groups such as the Teacher Advocacy Group (2020) also note that the demands for ECE teachers to document assessment, planning, internal evaluation and more, has steadily increased (Novak, 2019). Furthermore, a directive from the national Education Review Office (2013) clearly states that assessment needs to be linked to children's goals and next steps and that it should be used to guide planning and the curriculum.

Such initiatives emphasise that the effect of the school ready agenda on early childhood education is coinciding with efforts to professionalise early childhood teachers through education agenda and discourse (Westbrook & Hunkin, 2020) designed to make learning and teaching more visible. In this kind of environment the teacher becomes more of a technician, supervised by means of managerial and business agendas, with the goal of enacting policies, in terms of performativity and accountability to "order" teacher's technical competence. Such systematic organisation is not unlike Heidegger's *Enframed* system (explained in more detail below), as teachers become a "standing reserve", simply a resource, that needs to be at hand to be utilised as objectified pieces in the greater system. This system values performance, productivity, and outcomes.

Thus, a clear expectation that teachers need to forefront children's goals in the play-based curriculum is established, rather than a focus on play itself.

Due to the nature of play, the assessment techniques that are mainly used to evaluate its complexity are based on formative assessment styles rather than summative. Absolum et al., (2011) argue that assessment need not necessarily be individual and particular to a student; they suggest that it can be a collective, collaborative exercise involving a group of people and does not always have to compartmentalise and decontextualize knowledge, as knowledge can also be effectively assessed through direct experience in the natural world, in this case directly through play itself. Newton (2010) believes that assessment of educational phenomena such as creativity and play may be possible without a grading criterion. He discusses "consensual assessment" where experts asses intuitively (without conscious reasoning) according to what the phenomenon means to them holistically. Assessed elements could include fluency, flexibility, originality, elaboration, curiosity, risk-taking, using complex ideas, imagination, playfulness, persistence, intuitiveness, empathy and resourcefulness, with play itself becoming a platform for assessment.

3.2.3. The Framing of Play in Early Childhood Education

The effects of a standardised curricula focus and the requirement for progressivist assessment practices have caused play to become narrowly framed in education in a much wider sense. These limited attitudes towards play will be philosophically interrogated later in the thesis, by drawing from the Heideggerian notion called *Enframing.*

In many western countries, particularly in England and the USA, very young children's activities are being structured moment by moment in the name of "becoming school ready", in contrast to activities which support "play based discovery learning opportunities with open agendas" (Jarvis et al., 2014, p. 57), where children can build

their understanding of the world through people-based interactions rather than separately as individuals. This regimen is underpinned by the vigorous and regular testing of academic skills, in particular literacy and numeracy, mandated by the increasingly detailed instructions of governments on what and how to "teach". Wood (2014) suggests that when adults necessarily intervene in children's play to implement these types of academic goals and agenda, the probability of the complex benefits of play being lost becomes very likely, as these interjections can stifle the rich and complex processes of play, thus limiting its potential.

The loss of time and space to play is fuelled by the perception that children under the age of five need to be implanted with learning from every discipline through planned and purposeful activities, and have consequently left many preschool services' playgrounds quiet through the day (Miller & Almon, 2009). A similar picture is observed at schools where most of the school day is utilised for purposeful adult-guided learning to meet the requirements of the curriculum, resulting in break times that used to be dedicated to free play becoming shorter and scarcer (Lewis, 2017). In schools, short term gains in standardised testing now outweigh the need to acquire long term educational gains which are directly reflected in ECE institutions as an unsubstantiated need for setting goals of "readiness". McNess et al., (2003) found that once the goal of 'readiness' is set in any early education policy, the play-based teaching and learning practices traditionally offered within statutory education for children under seven are usually replaced by an academic preschool curriculum. When play opportunities do occur, they are reinterpreted as tools for teaching academic skills and hence "play" becomes the pivot of the school-ready discourse because Western pedagogy approaches to early childhood education are seen as being based on play. Such policy implementation systematises, standardises and nationalises early childhood education to permit international competition and comparison while developing services in ways that serve the economy (Westbrook & Hunkin, 2020), and

raises concerns that governments are using early childhood curricula to *Enframe* pedagogy in ways that meet their agenda.

When play is being Enframed in such a way learning is made the dominant force, with play its objectifiable tool, in Heidegger's sense of a "standing reserve". This pre-empts the possibility of seeing play in a different way. Anecdotally speaking: in my experience with many teachers, I have observed that they are often unaware of this positioning of play, so do not question it, or try to see it in different ways. This is another identified feature of *Enframing*, whereby it is rendered invisible to people who are, so to speak, inside the frame. In pedagogy play presents itself as an indicator of what quality teaching and learning look like. The dominance of learning over play is also implicit in the fact that the *Enframed* system wants to know everything about how learning is achieved with play being the tool, with examples provided of the different kinds of learning that children engage through play. It would appear that there is diminished interest at the institutional level in developing a broader and deeper understanding of how play supports learning. Given this stance, teachers feel an obligation to interrupt free play in order to provide pedagogical intervention that stimulates learning, achieves desired outcomes and generates sufficient evidence of learning for efficient assessment. These pressures are formalised in the early childhood education curricula.

3.2.4. **Commercial Framing of Play**

The Framing of play in Education is further affirmed by its commercialisation. This raises several issues that parent and children are unaware of. A number of media corporations took it upon themselves to present children and parents with a version of play which, drawing on current neuro-scientific research to maximise their profits (Sun, 2002), used the apparent innocence of play to transform an inquisitive wonderer at play into a docile consumer.

Since the 1980s marketers have been spending millions of dollars on enlisting child psychologists and their research to construct the child consumer (Reifel & Brown, 2004) with their agenda being supported by the media. The corporatisation of play has now reached its peak as large-scale organisations such as Disney have "refined and perfected its pedagogical influence" (Lewis, 2017, p. 12) through TV shows, movies, books, amusement parks, toys and computer games designed exclusively for child consumption. Commercial empires have become the new teachers of the millennium, where they shape play for children and their parents and teach them how to play the neoliberal game of becoming a citizen of consumerism (Kasturi, 2002), which translates as teaching them how to think by means of the discourses embedded in their products. The major discourse mediated is the discourse of consumption, which instils the target audience with the traits and habits of being consumers though the materialisation of the "Pedagogy of Desire".

This characteristically neoliberal view of education presents itself in the form of a process, where human potential and educational development become a private human capital (Davies & Bansel, 2007). Through carefully camouflaged discourses in public policy, the neoliberal agenda attempts to distance the nation state from public services and instead impose priorities such as self-determination, individualism, competition and choice (Westbrook & Hunkin, 2020). Such thinking reinforces the viewpoint of individuals needing to affirm their own self-capitalising interests over that of people who endorse the notion of a collective and common good. Many children quickly adopt these commercial messages, as they learn that to be popular with the friends they play with they need to have the newest toys and gadgets and to have watched the latest movies and TV shows that inform their play scripts, their imagination and their thinking. Pretence play through imitation, framed and constrained by the narrative of the media, erodes authentic pretence play, which has been demonstrated to have considerably superior developmental values as it enables divergent thinking, creativity, innovative ideas and entrepreneurship (Kasturi, 2002). In contrast, market-focused neoliberalism

fosters and encourages a competitive ethic with children by regarding other children as tools of one's own individual's progress, thus children becoming inured to an ethos of competition based on the survival of the fittest.

The collective effects of commercialisation of play on children are increased narcissism, anxiety and depression and an impaired sense of well-being in later childhood and adolescence. With children spending a lot of time consuming the media, time and space for them to play have consequently diminished (Jarvis et al., 2014); however, as will be seen, the media are not the only cause of this kind of erosion.

3.2.5. Consequences of Framing Play

3.2.5.1. Consequences for Children

A number of factors amount to the fact that time and space for free unobstructed play are being eroded. Children are not presented with nearly enough time and space where social play is not thick with observation and surveillance, or as Marjanovic-Shane and White put it, "when the footlights are off" (2014, p. 1). It is through unobstructed social interactions away from the gaze of the adult that play reveals itself fully to the player, when its value for the child is the highest and when play is at its most effective. Children's play is influenced by the presence of adults, because they are aware of the social and cultural constraints and expectations enforced by adults. Without ample peer-to-peer play, children fail to acquire the social and emotional skills needed to develop healthily, physically and psychologically (Jarvis et al., 2014).

Karsten (2005) suggests that the overall decrease in social interactions between children has also been affected by many families being working families and by altered communal perceptions which mean neighbourhoods are no longer deemed safe for children to inhabit unsupervised. Parents are also showing a preference for their children to participate in structured sports games rather than free play, while teachers discourage certain kinds of free play such as "rough and tumble play" and "war play".

Together these contemporary ways of re-framing play create a 'social trap' (Karsten, 2005, p. 222) for children, severely inhibiting many kinds of play.

Over two decades ago opportunities for collaborative free play were plentifully catered for by the local community and neighbourhoods and the people inhabiting them (Jarvis et al., 2014). The outdoors were freely available to many children as the communities were deemed safe, places where neighbours were looking after each other (Brown & Patte, 2012; Sutton-Smith, 1997) and children were able to become increasingly independent and able to develop relationships and learn the rules of engagements in social interactions. This kind of freedom is nowadays scarce for many children (Sutton-Smith, 1997). Neighbourhoods are criss-crossed by busy and often dangerous roads, and sensationalised news of accidents or incidents concerning children gradually increased parents' anxiety. Eventually the local neighbourhoods were not deemed safe enough for children to roam around without adult supervision, resulting in an "adult colonization of children's lives" (Corsaro, 2015, p. 38) that brought about a marked decrease in time and space for children to independently engage in social free play.

When Heidegger (1970) noted that imposing rules on play render it *Enframed,* he specifically mentioned organised games, arguing that they cannot be classed as free play, and will not carry with them the benefits of such play. Increasingly, sport leagues for children are being chosen by their parents and are replacing the opportunities for children to negotiate and create their own culture of play within a socio-cultural environment of choice (Jarvis et al., 2014). While parents prefer these forms of adult orchestrated play, research warns of the implications this kind of erosion of free play has on child development: Huizinga (2004), for instance, posits that homo sapiens (those who know) can only fully develop through homo ludens (those who play).

There is a marked difference between play and games, even though games are a subset of play. Types of games are characterised by two contrasting attitudes: *paidia* (turbulence, free improvisation, and carefree gaiety) and *ludus* (arbitrary, imperative

and purposely tedious conventions) (Mäyrä, 2008). Yet the distinctive difference is that play involves make-believe while a game is a closed, formal system that engages players in structured conflict and resolves its uncertainty in an unequal outcome (Walton, 1993). Games share their commonalties with play in as much as they are entered freely and voluntarily, and they involve repetitive actions to-and-fro where the rhythm of play is embedded in games and the pleasure of play is also manifested (Buytendijk, 1976). The traits that play does not share with games constitute make-believe; play has no goals, challenges, or structured conflict, its rules are not laid out in advance and there are no uncertain outcomes that favour one party. Hence the developmental outcomes play in general imparts are going to be much wider in scope, more profound and longer lasting.

Free play where children are given freedom to design and indulge in it the way they like, and where children are able to negotiate their own culture of play, has significant social and developmental implications for their development (Mäyrä, 2008). Often, however, play is looked at as either “good play” (Sacred Play) when it leads to orderly attainment of desired goals, or as “bad play” (Festive play), when it stems from children's interests and needs, and which is categorised as disorderly and subversive (Sutton-Smith, 1997). Parents perceiving sport as a version of good play is only one example of where play is viewed as good or bad. Rough and tumble play (RTP), categorised by many as “bad play”, is of particular importance for developing a social and hierarchical understanding between boys, yet this kind of play is routinely categorised by adults as “bad play” (Coie et al., 1988). A longitudinal study showed that the amount of time children were involved with RTP directly correlated with the level of success in social problem-solving (Pellegrini, 1991).

When regarding play from a historical perspective one cannot get past Sutton-Smith’s (1997) categorisation of play ideologies, or as he named them “rhetorics of play”. He proposed that at any point in history play as an ideology has also been play as a

discourse mediated through the positioned rhetoric of play. Sutton-Smith defined play as a heterogeneous phenomenon that relies on the eye of the beholder (Larsen, 2015) and building on that definition he theorised that the rhetorics illustrate a particular view of play in history. He proposed one of the core messages within this thesis: that anyone enquiring into play needs to be able to step outside their own culturally constructed understandings (that is, their frames or rhetorics) of play and begin to listen to children, and parents, about their personal notions of play and learning, especially cross-culturally. He recognised that play means different things across cultures as it is a culturally structured activity and he understood the cultural changes through time that constituted his genealogical model of play, where play cannot be discerned outside the socio-cultural frames that have been constructed by and for us (Lewis, 2017). The model creatively captures the multiplicity of theories that are annotating play.

The most important rhetoric to understand for the purpose of this thesis is that of progress, as it is the position of this thesis that the genealogical influences of this ideology are still strongly entrenched in the western world and are a major contributor to the erosion of play currently being witnessed. The progress rhetoric argues that play is a developmental process of children and animals, but not adults. It has dominated Euro-American thinking more as a belief than a demonstrated fact: the supposition that children's play is fundamentally about development, and particularly learning, rather than enjoyment (Sutton-Smith, 1997, pp. 9–12). This ideology has manifested itself in the stance of parents, teachers, policy makers and many scholars and is therefore to blame for many misconceptions about play (Smith, 2010). It permeated ECE and school curricula with its discourses, as well as the media and neo-liberal theory (Lewis, 2017).

The problem stems from narrow interpretations of Piagetian child-centred temporal development philosophy (Whitebread & O'Sullivan, 2012), with several other theorists contributing to this rhetoric. Froebel's "gifts" and occupations and his play curriculum

was one of the earliest forms of standardised, orchestrated play for children (Reifel & Brown, 2004). It was picked up again by Maria Montessori's philosophy of the progression of learning, using adult pre-selected materials for children to do "work" with. Another progressivist - John Locke - was the father of "sacred play". He actively discouraged children from playing outside and thought that they were better off inside the house with the alphabet. For Dewey (1986) play had to be orchestrated through adult guidance to ensure a purpose of learning intentions and a thread of continuity, culminating in a tangible outcome: it had to lead somewhere and amount to something. The progressivists shifted the historical context from a play attitude to a work attitude or in other words they changed the rhetoric of play from the rhetoric of "Self" that emphasises the desirable experiences of players such as the fun, enjoyment, pleasure, joy – and the intrinsic or aesthetic satisfactions of the play performances - to the rhetoric of "progress". Play's reputation has never recovered, as the importance of play for/as learning is still paramount, even though this is not clearly supported by research.

Numerous reasons why free play is important for the developing child have already been discussed here, and further investigation into the functions of play will reinforce this position.

3.2.5.2. Consequences for Researchers

By now I have shown that while play has proven to have immense developmental benefits, many stakeholders of play (particularly policy makers) have failed play in letting it fulfil its basic purpose. Their inadequacies in seeing play for what it is, *Enframes* it in such a manner that it is no longer able to gift children with its benefits, where at the end the children are the losers. Therefore, while a mass of research about play is available, this literature review has shown that a more philosophical and phenomenological lens on studying play is required in order to fashion new understandings about its ambiguous nature (Ohaneson, 2017). Consequently, reliable methodologies and methods to research and analyse play efficiently are also being

sought (Raphael-Leff, 2009). The literature suggests too that play can only be comprehensively understood when the beholder becomes actively involved with play as an experience (Whitebread & O'Sullivan, 2012); however, play studies are usually positioned outside the play experience while framing it from a certain predetermined play ideology (Sutton-Smith, 1997) which additionally confines the researcher. This thesis therefore suggests that the ambiguous nature of play in part originates in the lack of engagement of research(ers) with the actual play experience, which is, inevitably, pre-framed.

Before I attend to *poiesis* as a way of liberating play from the powerful forces of *Enframing*, I would like to explore another metaphysical notion important to how we "see" play. The following section will investigate the reason (Ground) for the existence / There-Being (Dasein) of play based on some further phenomenological thinking defined by Heidegger and his followers. An understanding of these notions will further strengthen my arguments for suggesting VR as a "saving power" for "seeing" play beyond its *Enframed* manifestation. I will hence once again call on the philosophy of Heidegger to establish a working theory about the link between play and life.

3.3. **Being as Play**

Despite, or perhaps as a consequence of, its ambiguity, play continues to attract interest within early childhood education as a pedagogical and curricular tool. Therefore, when play is being examined it is often conceptualised only in terms of its pedagogical potential, and alternative ways of studying play are not actively sought. This lack of a will for investigating divergent insights is another consequence of Heidegger's *Enframing*. I am suggesting that overcoming the present impasse and moving toward a better understanding of the multidimensionality of play, can be achieved by beginning anew with a fundamental ontology of play and its ontological connection to life (Being).

I decided to follow this notion in light of the question I posed in my introductory reflection concerning the connectedness of play and life. Interestingly Heidegger (Caputo, 1970) also identified a link between play (*Spiel*) and life (*Dasein*).

To explain this relationship, several important Heideggerian notions relevant to my argument need to be introduced. When discussing life, philosophically the question of Being (*Sein*) arises. It is not to be confused with Heidegger's notion of There-Being (*Dasein)* or, as I understand it, as an awareness of one's own existence. *Dasein* is then the ability to disclose the world, which arises from the fact that people are able to arrive at a comprehension of Being, but do not explicitly conceive it. Another important concept to define at this point is Ground, interpreted as reason. The process by which *Dasein* lays the ground of metaphysics is specified as founding (*Begründen*), which means to give a reason for what is founded, to explain it, to give it intelligibility (Caputo, 1970). As *Dasein* surpasses being through a comprehension of Being metaphysics becomes "transcendental" as it is grounded in the transcendence of *Dasein*.

What this means for life (Being) as a phenomenon is that it is that which appears and presents itself as a being, as to "found" the being is to bring it forth as a being, to render it intelligible and manifest as a being.

> Being is the inner power of the being by which it is. Being is the perduring power which remains whatever fluctuations may occur within beings. Being is the emergent power, stepping forth into the light of itself. Being as ground therefore is *physis*: the emergent-enduring-power. (Caputo, 1970, p. 30)

If due to the interconnectedness of play and Being I apply this premise to play, I could argue that play can be founded on playing and that to be able to comprehend it, we need to play.

According to Heidegger (2010) much like play, Being and even Metaphysics itself carries with it a measure of ambiguity, when considering the beyond Being or what he

calls Nothing, particularly when asking the question whether Nothing is "independent" of *Dasein*, something which *Dasein* interacts with, or whether the Nothing is due to the limits of *Dasein*'s comprehension of Being. If we then perceive Being (as ground) and Dasein (as founding) they cannot be characterised as two different things and they cannot have two different grounds. Furthermore, as Heidegger notes, Being is not a "thing" at all. This further affirms my previous consideration of play as having the same non-objectifiable characteristic and establishes another important link between play and life. Play and life (Being) are then original ground for themselves and the place of their revelation, as a final explanation and the final because, disclosing themselves as their own essence. This however implies a certain dogmatism, a final truth (*aletheia*) and is hence regarded by Heidegger (2010) as having an abyssal character, whereby Being as "because" (*Weil*) is all we know, but exactly what we need to know. In the thinking of ancient philosophers, ground does not need to be defined by reason, as Being is its own ground, it grounds itself, as a self-emerging power of Being – the reason of being is to be, the reason of life is to live, the reason of play is to play. The reason is itself without reason and it is this abyssal ground that he relates to a 'play' of Being.

Heidegger (Caputo, 1970) assumes that Being "plays" with people, where the role of the people is to play along with the play. Furthermore, he explicates that Being plays because it plays, while people are merely caught up in that play. Consequently, he assigns a key characteristic of Being (life) to play, namely that it is grounded in itself. As he talks about the play of the world, he also fore-fronts Being as a groundless play, where the "world becomes an eventful play of reflections of the simplicity of the earth and heavens, gods and mortals. The world is while it worlds" (Caputo, 1970, p. 35). In affiliating such cosmic processes with play, he significantly steps away from how the western world conceptualises science and philosophy, forfeiting a causal system. Therefore, the whole system of beings becomes ungrounded and exceeds any rational grasp, as does play. This way of thinking explains, affirms, and welcomes the ludic

dimension of play as a necessity, rather than something that needs to be rationalised. To attempt to rationalise play in this sense would mean to go against the fabric of Heidegger's phenomenological world; an authentic worldview, experienced in the ancient past, would for Heidegger draw on the wisdom of the more-than-rational, as a prelude to poiesis.

Within this philosophy the processes of the world, mission and Being are amalgamated into a single entity which affirms itself through a groundless play that does not allow itself to be rationally interpreted. Here truth and falsehood become one and they are equality important as while Being is intelligible it is also unintelligible, it is no less the falsum (un-truth, *letheia*) than it is the verum (truth, *aletheia*). This concealment exists because of Being itself and is not to be mistaken for a failure of the mind to grasp it. The hidden nature of Being is essential to it and, with its parallels to play, the same hiddenness may be essential to play also.

Heidegger (Caputo, 1970) himself said that the key importance for play was to be free, that even the existence of rule, order or thoroughness would "destroy the free play of the playing," (p. 37); when he talks of Being as play, he speaks of the ruleless play of the child rather than of a game with rules. Therefore, a pivotal connection between life and play according to Heidegger is freedom achieved in the absence of will and order, in other words, a freedom that is free of any kind of *Enframing*. It is this freedom, a groundlessness, that enables Being as play to resist rational analysis. Perhaps the Nothing, the abyssal void, is too wide for a human consciousness to grasp. We cannot comprehend the incomprehensible ground of free play. The innocent, incomprehensible freedom of a child at play originates from the free play of Being.

Being plays without any reason or ground; it just plays for plays sake alone, where the cause drifts into play. All there is and remains is play at its highest and deepest, an unfettered, always-changing dance.

Being is not answerable to people, as its unaccountability and supremacy over them is expressed by toying with them. Hence, play becomes an ultimately inexplicable character of Being itself. In other words, play is part of Being: they are related, inseparable, and groundless. Part of this toying with people is also ascribed to the withdrawal of Being in its truth. In our search for this truth it is important that we continuing to inquire about it, even though there may not be an ultimate answer to all the questions. Because play is related to Being, play too becomes an ultimate riddle (*aporia*), always hiding some secrets from the questioner. The will to know originates in playing, in the form of a desire to solve a riddle. Heidegger (Caputo, 1970) answers the question in a way that keeps it always open and significantly described play as an elusive phenomenon:

> The play of Being is the history of metaphysics as the withdrawal of Being in its truth. Being conducts a "masquerade" with man, concealing itself in its truth and hiding that very concealment. Being on this account is quite literally "il-lusive" (il-ludens). It plays with man by showing a masked face, an "il-lusion" which represents a withdrawal of its origin-al truth. In such a view Being carries on a pretense which it is the role of man to unmask. (p. 38)

Being will disclose itself to people by a revolution, a sudden turning about in the play of Being, where Being itself will take upon itself to turn its true face towards people and look into them. Heidegger's suggestion implies that as an observer would want to 'see' the inner workings play, play might in actuality abruptly reveal itself to the observer through the act of playing, where Being and play work as a singular force. Such a revolution is for Heidegger a form of subjectivism.

Being and people are in dialogue, a constant interchange, where their play becomes an inter-play, where people must keep being attuned to the playing of Being that is not frivolous or inconsequential (as rational thought, that often underestimates the magnitude of play, mistakenly sees it). Heidegger thought that rational language is

inadequate to express the truth of Being and hence he resorts beyond metaphysics to art in from of poetry.

This chapter outlined the way play is currently *Enframed* and philosophically interrogated the notion of *Enframing* from a Heideggerian outlook. At this point the thesis will shift its attention from the problem that play faces, toward a proposed solution for deframing play. The following chapter will therefore theoretically outline a suggested solution that will underpin the empirical study and its method.

4. Methodology – Re-framing Play in the metaphysical Laboratory

Heim (1993) proposes that for effective change to occur, people need to be subjected to strong sensations that would touch their innermost persona by imparting new feelings and attitudes as well as fostering a higher level of awareness compounding onlookers with an esoteric lens of insight. Based on these aspirations Heim propounds the idea of a metaphysical phenomenological laboratory with the 'capacity to evoke in us alternative thoughts and alternative feelings,' (1993, p. 137) placed within the virtual space. Heidegger (1996) refers to this process of extended insight as *poiesis*.

With this inspiration, the chapter that follows establishes a series of possibilities that address the carefully argued concern regarding play, and therefore informs the empirical part of this work. I start by operationalising *poiesis*, the Heideggerian concept that aims to counter the *Enframed* outlook on play, and then expand the implications of this notion further by focusing on the pedagogy of experience and by investigating embodiment theory, that draws parallels between the body, mind and the world. Next, visual and immersive pedagogies are summarised to set the stage for immersively experiencing knowledge in virtual reality. *Poiesis* that is delineated in this chapter, becomes the key notion to be invoked by the researcher and the participants in the applied method through the embodiment of play. Immersive videos – a form of VR - are used to represent play experiences in order to achieve *poiesis.*

Chapter Three established the idea that *Enframing* is the current mode of being in relation to play in ECE. As long as the relationship with play is one of demanding for its educational value, it cannot be experienced beyond its *Enframed* state, as it will remain tied to educational outcomes and it will be delivered to children completely ineffectually (Fitzsimons, 2002). While there are teachers and researchers who advocate for the importance of free play, *Enframing* insures that what they as

individuals believe is inconsequential, as the only factor taken into account is an increase in efficiency. Consequently, the question arises of what we can do in order to liberate play from its *Enframed* state. As *Enframing* is fundamentally a calling-forth, a challenging claim, a demanding summons, that gathers, assembles and orders to reveal (Hodge, 2015), perhaps a way to liberate play is by relinquishing our control and power over it. By ceasing to order play to manifest itself as an educational tool, we will arguably set it free to manifest itself in different forms.

However, because, through *Enframing*, play is in a framework or configuration that is with everything that it summons forth forever restructuring itself anew, the insights of a few are not enough to challenge the system. Awareness needs to be much more general. Heidegger (1996) suggests that *poeisis* may be the way to achieve this, even though "it is hard to see a place in this total system for the ancient *poeisis* or the emergence of completely new ways of revealing" (Hodge, 2015, p. 28).

4.1. Play as Poetic Art

I mentioned in my reflection that for me play has an aesthetic and perhaps even esoteric dimension to it. Heidegger saw a redemptive power in aesthetics, which has prompted me to explain the saving potential of *poeisis* by comparing play to art, as both have strong roots in creativity. This explanation will highlight another kind of musing/toying with philosophical concepts to arrive at new premises involving play.

Often artists utilise their creativity by playing with different ideas, perspectives and artistic techniques to create art as both activity and a product. Derek Whitehead (2003) brings some interesting perspectives to my endeavour of explaining *poeisis* through art and play. He seeks not only to revitalise the making of art by refreshing its connections with the Ancient Greek lineage of *poeisis*, but he also invokes the phenomenological notion of sensory embodiment (which I examine in some depth later in this thesis), and

he summons the philosophies of Heidegger and Merleau-Ponty, which have also been extensively applied in this work.

Whitehead (2003) interestingly embarks on the same phenomenological quest as myself with a different locale in mind. He suggests the use of *poeisis* – that which produces or leads something into being – to discover new ways to perform art and reflect on it as a way of reaching a deeper sense of how art works. I too seek to discover alternative insight and would like to support others to do the same, but instead of focusing on art, my focus is on play. Arriving at a place of deeper thinking is something that Heim (1993) talks about, as he suggests the establishment of a metaphysical laboratory in the virtual world, and this too I have endeavoured to achieve. Transcendence, as interpreted by Merleau-Ponty and Landes (2012), is another concept that resonates with reaching a metaphysical place where deeper understandings can be formed.

Whitehead (2003) sees *poiesis* as something that is always in process, as an undercurrent that is seeking to emerge. Drawing form Ancient Greek thought he stresses its interwoven relationship with *praxis* that signifies an intentional practical will, that may alongside *poiesis* bring forth a transformative encounter of the artist with art in the process of artmaking. Transposing the meaning of this notion to the process of play underscores important implications for learning more about it, and positioning the player to experience a transformative encounter with play can arguably occur through playing. In this situation play as an activity becomes the artistic medium through which the player learns about it, in the same way that the artist discovers the work within the work. The recurring theme of play only letting itself be fully accessed by the player, through the act of playing, demonstrates the power of play.

The significance of an artwork is often extended beyond the artist, the maker, towards the recipient, the observer. In my comparison of art and play this element proves to be very relevant, as I often talk about the observer of play and the misconceptions,

misinterpretations and ultimately the *Enframing* that occurs in the beholder, when she/he is not part of the dynamics of play. Whitehead (2003) makes an important point in this regard when he says that while art as a process seems to stay unobjectifiable, it produces objective works of art. It is the creative imaginative individual (the artist) who reveals new ways of being not only for himself, but also for the art's recipients, who are the observers and receivers of art. In my initial reflection I was regarding play as either an object or a subject, and decided that it was the latter. However, I have come to believe that it may manifest itself in both aspects: while the act of playing remains in the realm of subjectivity, the observable product of play, the performance, the way play reveals itself to the observer can be objectified. Just as a piece of art becomes an ambiguous object for interpretation by an observer, wondering about the creative play of the artists' subjective intentions in the artistic process, an observer of play strives to interpret the intangible act of play, to explain the play as *praxis* and the subjective forces that drive it. Perhaps then the elusiveness of play stems from play being lost in translation between the subjective and the objective manifestations of play.

Thus, according to Whitehead (2003), *poiesis* enables the artist to open up new territories of being for themselves and the observers, and while these new ways of being might not be the same, they may be equally transformative. If the same is true for play, then it means that the observer is able to become part of the dynamics of play not merely in the role of the observer who is actively reflecting about what is being revealed to them, but also that a form of aesthetic engagement with such engagement with play may prove as transformative for the observer of play as it is for the players themselves. I do ask myself what the prerequisites for such *poiesis* to occur are? What is the difference between an observer of play who continues to only see it in its *Enframed* state and the observer that is able to indulge in alternative ways of seeing play that have transformative, or according to Merleau-Ponty & Landes (2012), transcendental effects on them? To be able to attempt to answer this question I will need to explore *poiesis* further.

Poiesis would perceive play as something that was brought into being, something that was produced by the creative will of the player. It is about unveiling the *aletheia* (true essence) (Heidegger, 1996) of play and making it available for people to experience in the world. It has the power to bring forth play from its concealed state into full light through the act of playing. It is not to be seen as having practical features that can be applied at will, but, as the Greeks saw it, was a way to bring something into presence that becomes associated with making it seen, to enable it to become known and understood. For this reason *poiesis* seems to be the appropriate metaphysical notion for the liberation of play, given that play's cardinal elements seem to be concealed from view and are hence hard to comprehend. The fact that *poiesis* cannot be summoned at will may in part account for the way that play reveals itself to certain observers while being hidden from others. This raises the questions: what are the conditions under which *poiesis* reveals? And is my proposed method going to be able to meet them?

Whitehead (2003) says of Heidegger's philosophy that "sightfulness appears in our equation of *technē* and *poiesis*" (para. 12) where *technē* is the to cause for it to appear and *poiesis* produces it into presence. What is then required from the observer is a mind willing to play - a playful disposition - and play in the making, for a *poiesis* to emerge that liberates the wilfulness of a *praxis* for its own purpose. Once again, I have arrived at the same premise wherein the observer becomes the player with a willingness to play for play's sake. Here, Whitehead (2003) has stumbled upon the edge of Heidegger's groundless abyss, as he came to these same conclusions regarding art and notes that "the creative act spends or overreaches itself in allowing the disclosure of a work for its own sake and is thus outside any endpoint" (para. 22). Here the emotions of the artist play an important role, as they guide the creative process through their own inarticulate intentionality that finds expression through their bodily being. Zimmerman (1993) adds to this, when he asserts that the pairing of *technē* and *poiesis* gives them the capacity to let something be known through seeing. "Seeing" is here envisaged as an embodied function whereby the sense impressions of the body forms in the world

convey a certain meaning through the information received in an experience. ("Seeing" in this sense will be thoroughly investigated later in the thesis.) The artist has a body, therefore what is created has an embodied and performative character, as I have already identified as being the case with play. Just like play, art is a formless unknown that is not yet ready at hand, as a standing reserve that could be exploited, and is therefore letting itself being known by the observer in a multiplicity of different ways.

As Whitehead (2003) continues to explore Heidegger's thinking, he sees that art making becomes tangible when the intentions of the artist and the essential features of the artwork coincide. In relation to play this notion could be observed as an expressed correlation between how the child is experiencing play and how these constructed understandings of play are congruently presented through play as a performance. Acted out play can then be understood by an observer through their senses. From the concealment emerges *aletheia* in the form of a revelation of truth and the product of play receives its authenticity as a self-presencing thing; it takes a visual form in the sensual world and presents itself in its true reality, that is if the observer is attuned to the dynamics of play. The player creates play and is made by it in return, as they are instruments of one another. Thus, if the observer gets actively involved in this dynamic, they also become an instrument of play. At this point Whitehead (2003) makes a link between art and life, much as I have linked play with life. He notes that both the artist and the work of art need to concede to the world of their being. With such phenomenological rules established he suggests the emergence of a new kind of *poietical* place where the artist, the art and the receiver of the art are brought forward (in a Heideggerian sense) in the lineaments of their self-presentation. He refers to this place a space of 'unitary multiplicity', where the work of *poiesis* is also the *poiesis* of work, and the process of creating become one with the creation. Arguably, if in such a place the receiver of art could be replaced with the observer of play, the process of play and the way play presents itself to the observer, she/he would be welcomed to the inner workings of play wherein play would reveal itself.

As noted before, Heim (1993) spoke of a very similar place that he called the metaphysical laboratory and suggested it could be reached by stepping through the cybernetic looking glass into the virtual world, a world of infinite possibilities and reflections, a world where the individual can get in touch with their innermost being to establish new truths and realities about the world and its phenomena. Due to these capacities of the virtual world, I am establishing that it might be suitably equipped to indeed be the right metaphysical place for a phenomenological investigation of play, where *poiesis*, transcendence and unitary multiplicity are bound to occur. To bring forth a multiplicity of divergent ways to see and consequently think and learn about play through this process, I suggest that a uniting of the player (subject), play (subjectivity), the observable performance of play (object) and the observer (objectivity) is required.

Whitehead (2003) implies that in his space of unitary multiplicity we should "think more with our hands" (para. 27); in line with the characteristics of *poiesis* he suggests an active participation of our body in the process of thinking and learning, as the function of the body transcends its original simple purpose of communicating one's intentionality to instead host a place where multiple ideas of the mind collide with - in my proposed case - the raw experience of play. The amalgamation of the materials of the mind such as ideas, concepts, attitudes, schemata and the materials of the physical world, along with such a co-player, the play environment and play resources constitute for the player and their play a living environment (*Umwelt* – in Heideggerian terms), a *poietic* place that is void of all exploitative endeavours and hence void of any *Enframing*. Whitehead (2003) calls this encounter experimental *poiesis*, which emerges from an activity (play) as the ultimate expression of creative being and hence eludes any adverse *praxis* of the will. *Poietic* play is unobstructed creative play, unaffected by the will of anyone that is not part of play itself.

In this regard Zimmerman (1993) applies Heidegger's notion of ground to art and states that it does not need a metaphysical ground, as, much like Platonic ideal form, art is

not based on anything external to it, but sets its own limits and grounds for the things it founds. This view further affirms my own interpretation of play as I compare it to life. Zimmerman (1993) further merges the connection between art and life when he goes on to call art a living thing that is not founded on the will of the one who created it or on the principle of sufficient reason, as they exist because they exist. I argue that play too is imbued with life and as such follows the premises as depicted in Heidegger's notion of Being. Whitehead (2003) extended on this notion and suggests that art in this sense is hence autonomous, but also interdependent, because its essential solitude is being proclaimed through people as agents or performers. In terms of play this would mean that play has its own essential properties that manifest themselves only through people at play, whose *poiesis* comes to life explicitly through spontaneous and creative free-flowing *praxis* in the form of free play. In other words, I draw the crucial conclusion that the *poiesis* of play is free play.

On the basis of these interpretations of art Whitehead (2003) emphasises that contemporary art should re-engage with *poetic* art in order for *poiesis* to disclose the gift of art to receivers:

> In his experience of the work of art, "man [sic] stands in the truth . . . [that is to say] in the origin that has revealed itself to him [sic] in the poietic act." In this engagement, artists and observers "recover their essential solidarity and their common ground." It is the poietic act in the recovery of this shared solidarity that shows us to be the receivers of the gift of art. (para. 26)

I too am suggesting that the engagement with free play (the *poietic* form of play) may disclose to observers of play alternative insights about play through the gift of play and offer an intriguing connection between the player, play and the observer that will enable seeing past the *Enframed* state of play. The innermost essential characteristics of play are then defined by its particular *poiesis*. As it turns outwards play becomes dimensional. This outward turn of play is a turning toward the *poietical* space of the

player and observer in the interplay of their self-interestedness, in the simple joy that is received from play's expressive re-presentation for players and observers. This highlights another important feature the observer needs to have in order to see past the *Enframing* of play – a genuine interest in wanting to engage with play for the sake of joy. For this reason, I have included joy as one of the characteristics of play important to me in my initial reflection about play. The observer develops an understanding of play in this sense then, by recovering mutual solidarity and common ground through the origin disclosed to her/him in the *poietic* act. Play introduces an alternative conception of playing, where *poiesis* and *praxis* are bound, making and doing are done together. In this interaction the autonomy of play, as exercised by the player and the enactment of play through the human agent become integral facets that make up the *poietic* experience.

Finally, Whitehead (2003) stresses the importance of a connection between the mind and the body in creative production such as art, or in our example play. Being engaged in play constitutes the kind of creative expression that places itself in and through play that is, quite simply, let be. *Poiesis* has its own reserve, as what is held back and handed over through play is not unlike the Greek *epoche,* meaning something given and retained, hidden away from and readily available, consequently held concurrently in the dual flow of gift and reservation. In the sense of suspended judgement, play in play reveals something, but also retains something else, and I think that the reason players continue to return to play is because it is always enticing them with a promise of more gifts of play.

In term of experiencing and understanding play perhaps this return to *poiesis,* or in a broader Heideggerian sense, to nature, also means a return to an older knowledge tradition, of experiencing play first-hand with our senses, because the primary phenomenon of the world is a meaning-context, into which we are always already thrown (Ruin, 2012). Heidegger considered that in order to explain the problem of

Enframing, we should not attack technology, but instead understand the technological way of being. I should then perhaps avoid focusing too much on the issue of adult guided learning regarding play, but instead shift my thinking towards understanding the essence of the dynamics (framework) of play in its *Enframed* state.

Having ascertained that the workings of *poiesis* come to fruition through first-hand experiences, where individuals learn about phenomena directly, the next section will examine experiential learning and how knowledge traditions influence ways of seeing. The investigation will then move into visual and immersive ways of experiencing knowledge. This is a transition section that draws from theoretical examinations of the notion of "seeing" and sets out to explain the methodological positioning for the empirical study. This purpose-designed methodology, which will be described and explained below, becomes the centrepiece of my theoretical investigations and outlines philosophically, axiologically and phenomenologically the process of arriving at conceptual changes in people's subjective insights, attitudes and knowledge through experiencing via the physical senses. Accordingly understanding the pedagogy of experience and its alternatives must be highlighted next.

4.2. De-framing Knowledge through Experiencing

Current knowledge traditions alienate human beings from the way they have learned for millennia. Technology has enabled knowledge to become fragmented in a vast sea of information that, without real life experiences to anchor it, is vulnerable to framing, misinterpretation, manipulation and falsehood. Contemporary political truth has become false news, and, as I have argued already, play has became a tool exploited for learning.

Heim (1993) outlines some manifest drawbacks that the digital information knowledge tradition brought with it, such as that many people are now thinking on the screen, where faster equals better, rather than carefully formulating their thoughts before

contextualising what they constitute as knowledge. Heim (1993) proposes not only that technology pushes for increased quantitative productivity, which impinges on the quality of the produced knowledge, but also that computer software is changing how we write and think and hence exerting an element of control over our language, closing the windows to our thoughts and subjective knowledge production. In other words, the very way we form knowledge has become subjected to *Enframing*. Heim (1993) proposes further insights regarding information and knowledge in relation to the internet, stating that "[t]otal information is the illusion of knowledge, and hypertext favours this illusion by letting the user hop around at the speed of thought" (p. 38).

Another concern that Heim (1993) highlights is the effect of the Boolean logic that computer systems are based upon. As the system prioritises information which is ranked as most meaningful and relevant, the primacy of information holds a computational bias. Because meaningful knowledge must first be reduced to homogenized units to be usable in the context of Boolean logic, the sense of the overall significance of the information dwindles. While this system creates relationships between bits of information, it constitutes a disconnection from existence and to first-hand experience (Heim, 1993). This implies another form of knowledge *Enframing* at the level of language and semiotics. Jandrić and Hayes (2020) agree and add that "thinking, learning, and acting involve reasoning, but they cannot be approached via logic alone" (p. 286).

Such logic imposes abstraction and alienation from our humanity and takes no account of the fact that we are emotional, intuitive beings with an aesthetic and esoteric core of existence (Garrett, 1997b; White & Peters, 2016), for whom thinking is simply another way of musing which provides increased mental openness and allows ideas to emerge unplanned and unexpected. Often in the Western world logic distances us from our spiritual well-being and its narrowed awareness sacrifices the intuitive mind (Heim, 1993). A strong argument can be made that a return to the basics of knowledge

construction in the form of learning from experiencing with our senses is essential for the resurrection of knowledge that respects our human nature (Raphael-Leff, 2009) and to enable the process of *poiesis.* Accordingly, this next section will highlight the importance of the pedagogy of experience, which is a prerequisite for *poiesis,* and for the methodology used in this thesis.

While experiencing the real-life physical world is still the best way for knowledge construction, immersion in virtual worlds may be the next most effective alternative way to learn by experiencing. Theorising the learning process that occurs by experiencing through senses in the physical world illuminates the way this kind of learning might occur in the virtual environment. Professionals, including educators, are expected to understand the theory that is underpinning their work, but they also need to be able to perform their task with competence and skill. In this regard, learning from experience is viewed as very important by philosophers and educators such as John Dewey, Edgar Dale, Edmund Husserl and Jerome Bruner (Garrett, 1997). Dewey, for example, argued that theory and practice need to be closely related and that using the senses to indulge in experiences with the surrounding world will result in effective learning, and stressed that there is a strong relation between the terms “experience” and “education”.

Many of Dewey’s ideas, such as the importance of reflection for learning, influenced Edgar Dale’s ideas concerning experience. He contributed to Dewey’s ideas by suggesting an additional three factors for successful learning from experiences: needs, incorporation and use (Garrett, 1997). He developed a visual representation of modes of learning that are conditioned by a combination of senses, activities and learning media to produce a learning experience. He assessed the efficiency in retaining knowledge and skills from experiences gained through different combinations of these factors. The illustrative model based on his research is now known as “The cone of learning”. The cone indicates that the retention of learning is greatest when mediated

through direct first-hand experiences. It also highlights that the further the learner is distanced from direct experiences towards the continuum of symbolic representations of knowledge the lower the learning's retention rate becomes, due to acquired knowledge being less concrete. This again supports the notion that the most efficient learning is learning through first-hand experiencing, which is an enabler for *poiesis.* As the methodology in this thesis would enable learners to be in an active role of experiencing play as participants in play, it could be argued that even though they would be interacting with a symbolic (captured) representation of a first-hand experience, the learning experience in VR would still operate in the higher learning retention end of the learning cone, where the real experience would be simulated (Immersive VR Education, 2016).

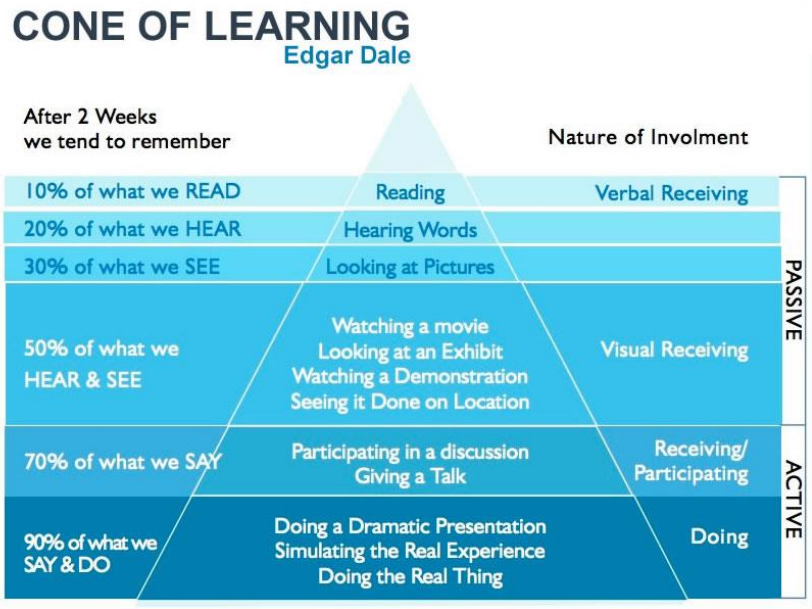


Figure 1: Cone of Learning by Edgar Dale
(Immersive VR Education, 2016)

Jerome Bruner added another aspect to the understanding of the learning by experiencing process when he developed his Theory of Instruction (Bruner, 1966),

which provided the underlying theory for Dale's Cone of Learning. The usual course of intellectual development, according to Bruner, starts at enactive and moves through iconic to symbolic representation of the world, and affirms that optimum learning will progress in the same direction, affirming that optimum learning will start from an experience with concrete embodiments of ideas that are close to the learner's life.

Learning form experience is an intersection where Dewey, Dale and Bruner meet with their common views that for learning to be at its most productive the senses need to be strongly involved and emotions are invoked, that there must be a culmination or fulfilment of other underlying experiences and that a sense of personal achievement and novelty are involved. These findings highlight important characteristics of experience-based learning, developed in classic philosophy that not only corresponds with the attributes of *poiesis,* but will also contribute towards an understanding of how to transpose experiential pedagogy to a virtual space.

Other current research about experiencing concrete ideas has been infused with the notion of multisensory learning. An American study (Mitchel & Weiss, 2011) focused on determining cross-modal effects, which include using a number of modalities (video and audio) in multisensory learning that occurs by stimulating a number of senses; in their case these were vision and hearing. The methodology of the study is based on three experiments in which they measured the effects of synchronous and asynchronous experiencing of audio and video streams on knowledge retention. At first, these streams were experienced independently and then researchers systematically varied the amount of audio-visual correspondence. This research found that the higher the cross-modal coherence was, the more successful were the learning outcomes. The researchers concluded that when an experience is perceived with a separate modal stream (audio and video), the learning is less coherent than when these are streamed together in unison in a multisensory experience.

A New Zealand study (Haggerty & Mitchell, 2010) pplied multiple modalities to support stronger literacy and communication learning outcomes in an early childhood education setting. They found that different modes interrelate and explored ways in which they may be combined in communicating and learning. Furthermore, they found that spatial and embodied ways of learning, beyond the visual and auditory modalities, are often overlooked by educators.

These studies show the importance of utilising multiple modalities across different senses for optimum learning outcomes which support the notion of learning from first-hand experiences as recommended by Dale, Bruner and Dewey. While this study involved audio and visual modes to realise an experience through video, VR technology has the capability of enhancing the experience even more. Consequently, applying cross-modal and multisensory experiences are prerequisites for the establishment of the metaphysical laboratory (Heim, 1993) in order to achieve *poiesis.*

While there is ample research focused on learning through experiencing, changes in human conceptions, knowledge, views and attitudes of the world through the senses are specifically addressed by the embodiment theory, and placed in the phenomenological paradigm.

4.3. **Phenomenology of Seeing Through the Cybernetic Lens**

This thesis has embarked on a phenomenological quest to investigate the capacity for de-framing play through VR as a means of opening up possibilities for teachers to benefit from seeing play as an immersive experience. The theoretical perspective that is being employed in this study emphasises individuals' subjective experiences as they appear to the consciousness and is regarded as "phenomenology" (Beck, 2015). Therefore this philosophical / methodological paradigm is of great importance to this thesis, along with the fact that phenomenology, as noted, gave rise to embodiment theory, which is the theoretical backbone of this research.

Phenomenology is the study of phenomena and it affirms that all problems transpire from the understanding of these, particularly the phenomena of perception or consciousness (Merleau-Ponty & Landes, 2012). In the case of this study, perception and consciousness play a significant role in defining subjective intrinsic truths about play, where play as a phenomenon is being examined. O'Toole and Beckett (2010) suggest that visual representations such as photographs, sketches and videos created by the researcher or the participants can be of key importance in phenomenological research. As VR has been described as the next visual tradition it is appropriate for it also to follow suit through the same theoretical methodology.

Phenomenology was named by Edmund Husserl (Merleau-Ponty & Landes, 2012) and then further reflected on by other philosophers such as Heidegger, Gadamer, Satre, Kierkegaard, Hegel, Marx, Nietzsche and Merleau-Ponty (Petty et al., 2012). A different form of phenomenology, distinct from Western views yet somewhat comparable, evolved in the philosophical ecosystem of Asia through the influence of Taoist and Buddhist philosophers (Hashi, 2015; Varela et al., 1991). As often occurs in academia some of the key concepts of the theory also differ within the west, given theorists' divergent interpretations and views. For instance, while Heidegger's and Husserl's phenomenology was sharply disconnected from the sciences, the thinking of Merleau-Ponty & Landes (2012), Dupuis & Wilson (2010) and Varela et. al (1991) linked phenomenology with disciplines such as cognitive psychology, neuroscience and technological sciences of artificial intelligence. These facts show that the scope of this theory is wide and that the interpretations of it are many; accordingly, some commonalities and significances specific to this research are going to be discussed next.

Phenomenology can only be accessed by a phenomenological method (Merleau-Ponty & Landes, 2012), therefore from a methodological standpoint this thesis' interest is to inquire about the experiences of teachers with the phenomenon of play through VR technology. Merleau-Ponty & Landes, (2012,) state: "The world is not what I think,

but what I live" (p. IXXXI). Hence phenomenology fits this inquiry, as its focus "is on understanding the unique lived experiences of individuals by exploring the meaning of a phenomenon" (Petty et al., 2012, p. 379). In this research, subjects experience VR technology and through it a technologically induced representation of an experience of play, which cannot be equalled to the experience with play itself. Therefore, the phenomenon this research investigates is not play directly, but a virtual representation of a play experience. This also necessitates investigating how efficiently a phenomenon in the physical world (namely play) can be represented in the virtual world and if such features as its ambiguity are retained. Should this be the case, it will also be necessary to investigate whether a phenomenon that is elusive in its nature in the real world can be uncovered in the metaphysical laboratory of the virtual world. Potentially this could happen (Heim, 1993), as VR technology enables experiences to be revisited in four dimensions with time becoming a manipulatable quality, making possible a much deeper "trawling" through these experiences as a phenomenological endeavour than ever before (O'Toole & Beckett, 2010, p. 61). This means a direct description of the experience as it is being experienced, without a need to satisfy objective scientific considerations, can be endorsed in line with this methodological tradition (Merleau-Ponty & Landes, 2012).

Traditional phenomenology portrays a return to "things" themselves and therefore does not worry about scientific explaining and analysing, but instead relies on describing. This underpins the aforementioned disconnect with science as the latter is regarded as too narrow to be able to determine truth (Merleau-Ponty & Landes, 2012). In direct correlation, standardised scientific views arguably misinterpret and as a result undervalue the phenomenon of play, which leads to its framing. From the phenomenologist's point of view, while play may be an ambiguous concept to the second-order expression of a scientific beholder, as already noted earlier in the thesis, its properties can be unveiled by means of the subjective perspective of consciousness through a first-hand experience of it. Hence the analysis that emerges from

phenomenology is a reflective and subtle one that works back towards the invulnerable subjectivity of the "inner man" (Merleau-Ponty & Landes, 2012). Here the subject is given to him- or herself while the (virtual) world is given to the subject and this relationship reflects a genuine creation – a change in the structure of consciousness. Reconceptualising an abstraction such as play hence needs to become a concrete experience that involves the numerous small reflections, sudden unexpected changes and fleeting tactile impressions that enable us to perceive its hidden properties. This relates to previous findings about immersive learning through experiencing. Arguably these experiences can be captured by a 360 degree 3D camera to represent phenomena to a yet unknown degree through immersive videos.

Merleau-Ponty and Landes (2012) state:

> Reflection does not withdraw from the world toward the unity of consciousness as the foundation of the world; rather, it steps back in order to see transcendences spring forth and it loosens the intentional threads that connect us to the world in order to make them appear; it alone is conscious of the world because it reveals the world as strange and paradoxical (p.IXXVII).

The ultimate goal of phenomenology lies in the form of a transcendental consciousness in front of which the world is laid down in an absolute transparency, which is intrinsically related to the phases of pedagogical immersion described earlier. The concept of transcendental consciousness is described as phenomenological reduction and has been much discussed by Husserl (1999); however, he was not able to fully maintain it. Merleau-Ponty and Landes (2012) suggest that total transcendental reduction can only be achieved by entities that take presence in the world as pure spirit, which is not possible while we are alive and embodied in the world. This poses the question of whether subjects are able to become "pure spirit" in a virtually constructed world where the bodily existence is left behind, what Heim (1993) calls, "the cybernetic looking glass", the border between the real and the virtual world. If we presume that

phenomena could be reproduced in the virtual world it would suggest that they could be understood there to a much higher degree than in the real world, which would account for the existence of Heim's (1993) metaphysical laboratory.

Another feature of phenomenology is its indent towards social interactions, where the experiences of the self constructively meet the experiences of others to create a sense of the world. A network arises, built from personal strands of subjectivity and connected into a web of intersubjectivity, where present and past meld together. Therefore, probing with questions within a social construct created between the researcher and the subjects is an appropriate method to be employed.

While, as described, traditional phenomenology severs science completely from research, Merleau-Ponty argued through his work that a shared illumination should be applied among a phenomenology of direct lived experience, psychology and neuroscience (Merleau-Ponty & Landes, 2012; Varela et al., 1991). From this viewpoint the body is seen as a bipolar construct built from physical and lived experiential structures, "outer" and "inner", biological (scientific) and phenomenological. This research endorses the view that science plays multiple important roles in it, with several correlations and "circulations" (Varela et al., 1991) between science and phenomenology being suggested. The way the senses biologically perceive experiences is of fundamental importance for this thesis, while on the other hand technology, another branch of science, is required to research phenomena and the cognitive sciences are also employed to understand changes in cognition of individuals. This view is further supported by Merleau-Ponty's recognition that the dynamics between phenomenology and science of experience cannot be sufficiently determined without examining the embodiment of knowledge, cognition and experience (Merleau-Ponty & Landes, 2012; Varela et al., 1991).

One of the predominant ideas of phenomenology is embodiment theory. As noted, this theory is an important theoretical orientation for this thesis, as it focuses on learning

from experiencing the world through senses in an embodied – immersive way. It is hence argued that achieving a state of *poiesis* may be aided by the notions presented in this theory of learning below.

4.4. **Embodiment Theory**

As embodiment theory combines experiences of worldly phenomena with the physical and affective sensations generated from the world and the inner subjective perceptions, attitudes, views, feelings and conceptions of an individual, it is a highly appropriate theory for the development of this study's methodology. Both Heim (1993) and Heidegger (1996) stress that to achieve a state of being (*poiesis*) by the individual transcending their current *Enframed* attitudes that have been based on a rigid world view, and achieve alternative insights, truths, outlooks, perceptions and beliefs regarding specific phenomena (play). Hence I argue that embodiment theory is instrumental in carving out a route to understanding how individuals might be able to de-frame play. It was developed by Heidegger's mentor, Edmund Husserl, referred to as the Father of Phenomenology (Beck, 2015). Broadly speaking, embodiment theory is viewed from two predominant positions, those of neuroscience and philosophy respectively (Wermcrantz, 2009). Therefore it was also adopted in this thesis because both of its conceptive views are relevant for learning through experiencing and as some of its aspects are already in use in research with VR technology (Portnoy, 2017). Furthermore both the thesis and the theory are grounded in the phenomenological methodology and in the paradigm of perspectivism that inform the methods of this study (Kiefer & Trumpp, 2012).

The concept of learning from direct experience resonates with the principle of embodied cognition, where learning is categorised as a cognitive process enabled by generated neurological changes in the environment caused by bodily experiences. In

addition, it could be argued that the proposed methodology seeks to simulate the process of embodied cognition (Jang et al., 2010). The views of embodied cognition also intersect with the proposed methodology's view on enabling subjective knowledge construction through learning from experiences. Wermcrantz (2009) sees human beings as objective entities, insofar as their bodies are similar and subjective as much as they are different from individual to individual. He suggests that humans evolved to interpret the "natural world" in similar, objective ways but that individual humans are different and carry "particular evolutionary-friendly embodied goals," (p.40). Through the perception and learning, a person's cognitive system operates across brain-body-world partitions by continually reconstituting the "sensory world" as it unburdens its subjective dispositions into sensory objects for its individualised embodied, evolutionary purposes.

The same concepts of embodiment discussed above have been thought and theorised about from a philosophical stance, particularly the key connection between the world, body and mind. The idea of embodied cognition is in strong contrast to the earlier theory of the duality of the mind and body proposed by Descartes (Portnoy, 2017). Descartes supposed that the human mind is the superior thinking tool and constructor of meaningful knowledge about the world from life experiences, in contrast to the perceptions of the imperfect body. Some philosophers and psychologists argued against this view and suggested that the interactions of the body inform the cognitive mind and the two are therefore interdependent, rather than distinct from each other. Cognition is thus shaped by the intrinsic relationship between the mind and body to enable us to understand and navigate our world, create meaning from the world which surrounds us, and ultimately to learn.

As noted the concept has been investigated by theorists such as Heidegger and Dewey but the phenomenology of embodiment has been most thoroughly discussed by Edmund Husserl (*Internet Encyclopedia of Philosophy*, 2017) and later by Merleau-

Ponty (Merleau-Ponty & Landes, 2012). In Husserl's phenomenology of embodiment the body is the centre of experience, with both its movement abilities and its various sensations being of key importance in the way individuals encounter phenomena or other embodied entities in a common coherent and ever-explorable world *(Internet Encyclopedia of Philosophy*, 2017).

Husserl focused on the importance of experiences informing knowledge production rather than merely viewing it as a form of practical action, as experiences have the ability to re-conceptualise perceptions in any world, and this may now include the virtual one. Through his investigations into the essential structures of conscious being and the concept of experiencing he saw human consciousness as transcendental rather than mundane. Therefore cognitive conceptualising is not seen as being part of the wider world, but instead signifies a constitutive requirement for experiencing the world (Husserl, 1999). As noted previously, *poiesis* is also a transcendental process that would enable individuals to transcend their *Enframed* attitudes about play and de-frame them by developing new insights about them.

Husserl's contributions are adopted by this study as several of his interests mesh with the scope of this thesis. He was focused on the elusive, unseen, unnoticed, subconscious and subjective, seeing them as the deeper layers of subjective experience that are often left unnoticed in day to day life (Husserl, 1973). His quest to illuminate the ambiguous nature of phenomena through subjective experiences resonates with this thesis's aim to offer further subjective insights into play (*poiesis*). Furthermore, his views about the "ever-explorable world" mentioned above can transcend the limitations of being anchored to the physical world, by expanding its ambit to the virtual world. The virtual world has the potential to grow indefinitely and evolve into a complex ever-changing space inhabited by both "real" and artificial intelligences (Berger et al., 2016; Heim, 1993; Jarmon et al., 2009; Stavroulia & Lanitis, 2017).

Husserl's notions expressed in the embodiment theory have been applied as a framework at a number of levels ranging from researching experience based learning to developing artificial intelligences (Wilson & Foglia, 2016). Several recent research projects involving virtual reality technology as an educational tool have based their work on embodied cognition (Cook et al., 2008; Jang et al., 2010; Portnoy, 2017). Sowa (2016) goes as far as suggesting that humans have their own virtual reality system internal to their minds in relation to the bodily perception of the physical world as well as the ability to interact with it through cognition. Hence an artificially constructed external virtual reality system aims to simulate the internal biological one. Portnoy (2017) suggests that while there are many technological learning tools available, none of them "seems as promising in delivering learning through embodied cognition as the new wave of technologies such as Virtual Reality (VR) where learners worldwide are able to interact with content in ways never before available" (para. 7). With this statement she inevitably implies a move from visual pedagogies towards immersive pedagogies as VR enables learning in an immersive virtual environment that engages several senses and modalities.

4.5. Immersive Pedagogies as a Lens of Seeing

Immersive pedagogies hold a central importance in this thesis, as they have the potential for representing and simulating experiential learning experiences in an embodied way. Such learning, as discussed before, may be able to overcome the *Enframed* view on educational phenomena such as play and provide a way towards a multiplicity of meanings and interpretations.

Contemporary technological advancements are now enabling us to visit cyberspace through a process of "consensual hallucination" which is an interpretation that Heim offers about the use of VR that he adopted from Gibson's science fiction book *Neuromancer* (Heim, 1993). If we consider Raphael-Leff's (2009) outlooks on play, we could argue that the methodology being developed here offers participants the

ability to attain new insights about play, by experiencing a “conscious dream” within a “consensual hallucination” through the senses of the physiological body in order to attain *poiesis.* In this sense, experiencing or “seeing” play becomes a pedagogical engagement, where the participant engages through their senses with the events transpiring in the virtual world. “Seeing” would then affect the observer’s mind by changing, altering or edifying their attitude towards play and thus they would become, even if only subtly, a different person (White, 2016a). The concept of “seeing” in education is investigated and applied through the field of Visual Pedagogies; however, as this research methodology expands its scope beyond the visual into full body immersion it constitutes a new sub-category of Visual Pedagogies referred to as Immersive Pedagogies. I propose that this technology could be the saving power that could persuade the custodians to release us from the *Enframemen*t of play as a state of *poiesis* is achieved.

With steadily increasing access to affordable audio and video technology the rise of the age of visual cultures was inevitable. The use of visual media in research has, however, not developed congruently throughout different academic fields. Even though the legitimacy of research into visual repertoires is seen as significant in fields such as visual anthropology and visual sociology (Farné, 2017), visual pedagogy has not developed in the same way, and the educational act has not yet solidified itself as a specific object of visual representation.

However, for visual pedagogies that retain an ontological and epistemological connection with aesthetics to thrive, a further shift in understanding of the value of aesthetics to academic research is required. White (2016c) stresses that for forms of aesthetic production - such as the moving picture - a critical consideration of their significance as a contributor to the field is central for disciplines that rely on research developed in correspondence with aesthetics such as visual pedagogies. When using a visual aesthetic event for research purposes, a specific consideration “of the living,

evolving, shifting and located (ideological) nature of meaning in the event itself, as well as its aftermath," (p. 3) is required for a reliable critical examination. Again, this parallels the issue of play where the lack of such considerations about its distinctive nature contributes towards its erosion. Through the use of an intuitive interpretation of what is observed in the aesthetic experience, a subjective critical view is established, generating a new truth through the act of "becoming" (White, 2016a). Seeing becomes a pedagogical engagement where new insights and understandings are developed from what can be seen, causing changes in the individual's conceptions of the world. White (2016c) further suggests that insights from the concept of "visual surplus", meaning seeing from different viewpoints (one's own and others'), enable observers to develop alternative insights beyond the limits of what they can see on their own. This further contributes to effective knowledge production through the notion of "becoming". A further investigation into becoming will be made later in the thesis.

White's (2016c) idea of "seeing" from different viewpoints intersects with the ideas of Heim (1993), who offered similar findings when discussing the potential of VR technology, by suggesting that new insights could be developed beyond one's own limit when interacting with virtual experiences in the digital space. This exemplifies a relatedness of the traditional visual modality with the one of VR, which Pujol-Tost (2011) alluded to by referring to VR as the latest evolutionary stage in the western pictorial tradition of perspectivism. This development marks the sprouting of yet another branch on the evolutionary tree of pedagogy, growing as a subdivision of visual pedagogy. The defining feature of the new tradition is evolving beyond the visual modality into a cross-modal and multi-sensorial immersive experience that enables teaching and learning mediated through a representation of "reality". Thus, due to the evolution from the visual tradition towards an immersive one, the new branch on the tree of pedagogy may be referred to as "immersive pedagogy".

When an immersive experience is used for teaching and learning purposes, the ever-expanding array of ideas, views, perceptions, methods and approaches derived from visual pedagogies are still relevant; however, they may need amending, adapting or expanding to fit the new mode. Perhaps introducing visual pedagogies to embodiment theory may be the catalyst required to conform the visual mode to an immersive one. The theory of embodiment grounded in the phenomenological methodological paradigm can help to interpret the effects on the cognitive processes when learning is occurring in an immersive experience. It examines the changes in cognition brought about by the exposure of the human mind to multi-sensory stimuli generated from the environment to induce new learning, hence it provides the missing link between the visual and the immersive.

While this thesis affirms that currently nothing can replace learning from direct experience in the physical world, it also suggests that various circumstances may hinder or prevent people from accessing certain extremely valuable knowledge attained from experiences. Some experiences cannot be accessed, as they may have passed in time or are physically too far for people to reach. For example, experiencing a living dinosaur standing in front of you, or exploring the deepest depths of the ocean, or the furthest reaches of the universe, are not possible in real-life. In the context of this study there are play experiences, as illustrated earlier, that cannot be accessed in desired forms for research, professional development or training purposes. Hence an alternative to learning from real-life experiences might often be desirable. It is suggested that VR technology is and can usefully become still more of an alternative to real-life experiences. For the reader to be able to understand the use of the technology for the purposed of this thesis, VR is discussed in the following section.

In order to be able to “playback” a representation of an experience in the virtual world, it first needs to be captured. The particular form of VR in which a real-life experience

can be represented through capturing a 360-degree 3D video is referred to as an “immersive video”. To be able to understand how immersive videos as a form of VR technology can enable experiencing knowledge in a virtual world, a further investigation into VR technologies including their ontology, history and application in education is needed.

4.6. Virtual Reality

4.6.1. The Rise of Virtual Reality

Panoramic paintings produced in 18th century Europe were an early response to the central function of VR – immersion. The first references to the concept of VR appeared in science fiction literature. Stanley G. Weinbaum's 1935 short story "Pygmalion's Spectacles" describes a device that was capable of the holographic recording of fictional experiences, including smell and touch. The properties of VR were referred to in Morton Heilig’s "Experience Theatre", written in the 1950s, which described how VR might encompass all the senses, thus drawing the viewer into the onscreen activity (‘Virtual Reality’, 2016). Before the 1960s, the fundamentals of VR had been established including numerous approaches and methods that are still being used today (Arnaldi et al., 2018). A working prototype was designed in 1962, called Sensorama, which engaged several of the viewer’s senses (sight, sound, smell and touch). This same idea was also the inception of the stereoscopic function that was the basis for 3D movie theatres that emerged later. In 1968 Ivan Sutherland and Bob Sproull created what is widely considered to be the first VR and AR head-mounted display (HMD) system. It was primitive both in terms of user interface and realism. In these early years of VR development the focus was on developing the concept into a practical working model, but considerations for its application were still very open, hence there were not yet any apparent signs of *Enframing* in terms of this technology.

Between 1960 and 1980, computer sciences emerged that enabled the development of the basic VR equipment used today, such as the technology needed for production of synthetic images, modelling of 3D objects, rendering algorithms and the optical technology manipulating light (Arnaldi et al., 2018). The technology that provides the interface between the user and the system was also developed at that time alongside exploration into force feedback. Software also progressed, driven by the military development of flight simulators in the USA. As soon as the technology was available it was employed to serve a specific purpose. Steering it towards a specific focus is already a sign of *Enframing*, but as it is not creating a standing reserve as such and as it may have been used to reveal something to the trainees, I would not categorise this use as *Enframing*.

The concept of VR was later popularised through movies such as *Brainstorm* (1983) and *The Lawnmower Man* along with the appearance of the non-fiction book *Virtual Reality* (1991) by Howard Rheingold. Thus began the VR research boom of the 1990s and the establishment of the term "virtual reality" (Arnaldi et al., 2018). *CyberEdge* and *PCVR*, two VR industry magazines, began publication in the early 1990s on the topic of theoretical applications of the technology. From 1970 to 1990, the VR industry focused on providing devices for medical engineering, flight simulation, automobile industry design and military training purposes. With the employment of VR technology for industrial, manufacturing and engineering purposes, the *Enframing* of the technology became stronger, as it became an aid for stocking ready at hand resources and its application was narrowed towards production.

In the years between 1990 and 2000 experimentation with several prototypes started as well as the emergence of ways to apply VR commercially. In 1991, Virtuality Group launched *Virtuality* and became the first mass-produced, networked, multiplayer VR entertainment system in the form of an expensive arcade machine. In the late 1990s, the video gaming industry created several devices that did not become popular and

were thus abandoned, but several other gaming VR devices emerged, such as Sega VR (1993), Virtual Boy (1995) and VFXA Headgear, and those brought significant advancements to the technology that are still used today. The application of VR also took place in other industries such as medicine for managing pain, transport for training drivers / pilots / operators, and the oil and energy industry. At this time VR technology became heavily commercialised and while some of its uses may have still contributed to the revealing of new knowledge, its main purpose became the generating of capital, which is the definition of ready at hand resources.

The industry did not reach consumer maturity until the years between 2000 and 2010, when the technology evolved to a point where its application diversified significantly into practical applications, such as maintenance and training with the use of simulation to control industrial processes, for example, the remote monitoring of a factory from headquarters. A number of environmental phenomena started to be monitored with VR technology to inform the field about their next steps in manging environments. The oil industry also further developed their branch of VR technology for their drilling operations, while the technology started to be used in the financial markets and more predominantly product design, where virtual product presentations started replacing real-life prototypes. It would seem that VR Technology arrives at its highest level of *Enframing*, now that it is being utilised in Heidegger's literal sense of revealing natural resources such as oil for stockpiling and exploitation.

It was not until after 2010 that the technology was deployed to the larger public, when the costs of the devices enabling a high-quality immersive experience became affordable for private individuals. In 2010 Palmer Luckey, who later went on to found Oculus VR, designed the prototype of the Oculus Rift. This initial design would serve as a basis for contemporary models ('Virtual Reality', 2016). In 2013, *Vendetta Online* was the first Mass Multiplayer Online Role-Playing Game (MMORPG) to support the Oculus Rift, making it the first online "world" with native support for a consumer VR

headset. Since 2013, there have been several VR devices that have sought to enter the market to complement the Oculus Rift consumer product and to, ultimately, enhance the game experience. Smartphones and videogames indirectly boosted the development and sale of VR, while regular worldwide dispersion of media news about VR raised the interest for it in the public domain (Arnaldi et al., 2018). From the world of video games numerous software applications sprouted and enabled most developers to start producing VR content.

Contemporary developments have profoundly transformed the VR landscape in its dissemination, technological advancements and use. In the last 10 years the growth in all these areas has been exponential. This has spiked an interest of large organisations such as Google (Google Glass), Facebook (Oculus Rift), Microsoft (HoloLens & Windows Mixed Reality), Sony (PSVR), HTC Valve (Vive), Samsung (Gear VR) and Apple (still in development) that have been investing heavily in VR development. It is a defining feature of the *Enframed* system within which our society operates that whenever a new technology arises with a potential to generate income and stockpile resources, it is quickly adopted. I think that this rapid reaction of the market is a way of assimilating the technology into the *Enframed* system before it has the opportunity to become something else.

Clearly the current decade has been rich with product breakthroughs. Free-to-use VR software development applications emerged such as Unity 3D (2019) and Apple's ARK kit (2017), providing for a democratisation of the technology. The development of high-end mobile devices that already came with many of the required features for mobile VR made re-deployment of the mobile phone industry into mobile VR industry an easy transition, as the Samsung's Gear VR and the Oculus Go devices illustrated. VR software applications became as accessible and cheap as any other mobile applications, causing a ripple effect to other non-mobile platforms. Video games, as mentioned before, played another important role in the democratisation of VR software

and hardware with low acquisition costs (Arnaldi et al., 2018) and satisfactory quality. The demand for high-end video game systems also continued to push the specifications of computational processing unities (CPU) and graphics processing units (GPU) that provided the processing power to enable acceptable VR technology standards for human use to become a reality (Virtual Reality Society, 2017). VR technology became a catalyst that demanded that the rest of the technological world evolve, adapt, and reconfigure in order to accommodate it in the system. Some would call this the progress of technology, but Heidegger (Ruin, 2012) might have referred to it as moving cogs in the clockwork of *Gestell.*

With the shift from using VR and Augmented Reality (AR) devices being for research and corporate use only to their becoming a household item, the number of users of VR technology exponentially increased and continues to do so. It is speculated that the true benefits of the technology are yet to be unveiled and that the explosion of its mass use is still to come (Arnaldi et al., 2018; Bailey et al., 2011; Gadelha, 2018; Mullins, 2016; Rubin, 2018; Sowa, 2016; Stavroulia & Lanitis, 2017). The use in 2018 has climbed to 171 million from 200.000 users four years ago and it is anticipated that this number will rise by over three thousand percent in the next four years (Statista, 2018). As it stands, 26 million of these devices are currently owned by private consumers. According to the latest estimates, as many as 5.5 million units are set to be further shipped to customers worldwide in 2020 (Lin, 2020). The latest virtual reality statistics show that the global market size of AR and VR is forecast to hit $18.8 billion in this year (2020).

4.6.2. The Standing Reserve of VR in Industry

While VR has been in use in industry for some time with a few larger corporations, since 2005 it has significantly diversified in its applications. Most of the applications at that time focused on the research commons, with developing and maintaining links to higher education research and development at the forefront. From 2005 to 2010

many companies started implementing VR for 3D prototyping and taking advantage of opportunities brought by the immersion factor (Virtual Reality Society, 2017). Companies such as CLARTE, Institut de Chalon-sur-Saône and Plastic Omnium (Ma & Grafe, 2011) developed innovation research departments to explore the potential of VR for company profitability and innovation, underlining the systematic drive of Gestell toward accumulating monetary standing reserve. Between 2010 and 2014 the industry included in their scope the development of shared platforms in the form of institutional virtual environments in order to share resources, and this led to the applications developed by CAVE and LAVAL, where images projected on walls, ceilings and floors create a virtual environment (Laval, 2018).

From 2015 onwards, VR headsets revolutionised the use of VR in the industry with the emergence of the first Oculus device, followed by other devices such as the HTC Vive (Newman & Chacos, 2018). This transformation was brought about by a combination of characteristics, namely that these devices were user friendly, provided a good level of immersion and were relatively cheap compared to previous high-end set-ups such as the Visiocube. Hence investment into VR in industry research started to shift from VR devices to VR software, which changed the research emphasis significantly. The core purpose of software is to make the technology usable in a certain predetermined way assigned by its parameters and design, which frame the use of the technology according to the viewpoints of the designers.

Overall industry interests in VR aimed to develop capability for immersive project reviews, assembly and disassembly of products, and an interactive design where VR becomes a tool to support effective decision making. The focus on products limits the application of the devices to industrial uses. Furthermore, VR has been widely invested in for its capabilities to revolutionise communication and marketing, to support sales and add value to products and services (ESI Group, 2018), again increasing the standing reserve. In some of the leading French technology companies, codesign and

collaborative practices have become the backbone of the rapid implementation of VR technologies, by focusing on user-centred design approach to operations. VR tools became reliable and high-performing, and intuitive even for first time users (Arnaldi et al., 2018; Nexter Robotics, 2018). VR technologies enable complex industrial projects to be presented in a relatable concrete form for everyone (Optis Group, 2018). This growing adaptability of the technology enables it to reach a growing number of consumers and introduce them to the "norm" of VR technology in the *Enframed* system.

However, VR is also being applied in less *Enframed* ways, due to people's ingenuity and creative thinking. Virtual reality technology has also become important in urban planning and development, specifically in terms of mobility aids, travel, architecture and more generally urbanism (Virtual Reality Society, 2017). Digital orthophotography of cities represented in VR can support urban developers to better plan their urban landscape and predict limitations or disadvantages of certain projects.

VR and AR technologies are being increasingly used for training purposes of pilots and in the medical profession, particularly for simulation, planning, remote interventions, computer-assisted surgeries (Wang et al., 2016). Since the first X-ray in 1895, imaging in medicine has diversified continuously. This development has led to VR imaging tools now having the ability to recreate a patient's 3D data interactively in a virtual environment for diagnosis, prevention and planning of operations (Virtual Reality Society, 2017). VR is also used as a training tool for surgeons, with no risk to patients (Garland et al., 2018).

4.6.3. The Standing Reserve of VR in Education

The use of the technology for training and learning purposes extended beyond the medical, military and aviation industry, to a more widespread use for education and pedagogy. The following section will investigate the use of VR technology in education,

and will provide a comparative platform for the pedagogical study developed in this thesis.

The organisation *Immersive VR Education* describes the benefits of VR for education:

> Using Immersive VR Environments we can place students in any real world or virtual situation with an active role in proceedings through various tasks they will need to complete. Situations and outcomes will dynamically change depending on the students input and this will keep the student active and engaged throughout the lesson. Students of all ages typically retain between 10% and 30% of that they read and see. Traditional educational materials fail to inspire and engage further learning with most students as it forces them into a form of memory testing rather than retaining knowledge through practice and experience. Traditional lessons are also taught through ridged structures that don't change if repeated. This causes fatigue and boredom with less student retention (Ed tech, 2017).

Arnaldi et al. (2018) agree, and describe the advantages of using VR in professional and academic teaching as the removal of risk to people, and the ability to use materials and equipment that are too expensive or too difficult to access, to recreate situations that may be otherwise too complex to achieve, to control the educational situation and the environment, and to develop new ways of collaborative learning.

The educational sector has, in some ways, adapted and reformed itself in the wake of technological advancements. One example is online learning in tertiary education (Kukulska-Hulme, 2012), but not nearly to the same degree as other sectors, such as anthropology, psychology and other social sciences (Bailey et al., 2011). When considering whether to implement new technologies such as VR a lot can be learnt from recent developments. Expectations were that advancements in IT would result in higher student achievement, but the findings of the Boston Consulting Group sectors

(Bailey et al., 2011) confirm that this was an overall failed attempt. Adjustments to the education sector are seen as risky as their success is hard to predict. Some research suggests that those innovations that are successful in education are the ones that manage to retain a significant degree of cultural momentum (Maddux & Johnson, 2011) and that when technology is strategically introduced into every step of the educational value chain, it has the potential to enhance every aspect of instruction on learning sectors (Bailey et al., 2011). A number of influential internet sources claim that VR is likely to be the next major social phenomenon (Baumgartner, 2016; Business Insider, 2017; Hu Au & Lee, 2017; Lawrie, 2017; Mullins, 2016; Stavroulia & Lanitis, 2017). Several new educational techno-tools have been developed and have advanced significantly, yet there are a number of barriers to be overcome before these can be used productively, and the same applies to VR technologies. Some of these challenges include a lack of appropriate information and the infrastructure of ICT, as well as funding and, perhaps foremost, the ability to change entrenched teaching practices into something new and innovative. This challenge illustrates the need for change in the perception of stakeholders, starting with educational theorists and philosophers.

Given this context, there has been a recent paradigm shift in the way theorists and researchers view the use of educational applications and computer games for enhancing educational outcomes. It is now accepted that contemporary technologies can significantly enhance the engagement of learners and further increase motivation. It is also now the view that the rapid increase in the popularity of computer and communication technologies will cause more technology-based learning to occur and that these technologies are going to become more significant within the education sector (Hwang & Wu, 2012).

VR is already used by trainers from a variety of fields to furnish learners with a virtual environment wherein they can develop skills without real-world consequences of failure. The application of VR as an educational and training tool was first introduced

by the military. Thomas A. Furness III was one of the first to develop the use of VR for military training when, in 1982, he presented the Air Force with his first working model of a virtual flight simulator he called the Visually Coupled Airborne Systems Simulator (VCASS). When he started his work on VCASS, aircraft were becoming increasingly complicated to handle and VR appeared to offer an improvement on previous training methods. Furness used his knowledge of human visual and auditory processing to create a virtual interface that was more intuitive to use than the existing design (‘Virtual Reality’, 2016). The second phase of his project, which he called the "Super Cockpit," was even more advanced, with high resolution graphics (for the time) and a responsive display. Furness is often credited as a pioneer in VR for this research. VR plays an important role in combat training for the military. It allows the recruits to train in a controlled environment where they are to respond to different types of combat situations. A fully immersive VR that uses head-mounted display (HMD), data suits, data glove, and VR weapon are used to train for combat. This setup allows the training's reset time to be cut down, and allows more repetition in a shorter amount of time. The fully immersive training environment allows the soldiers to train through a wide variety of terrains, situations and scenarios (Bymer, 2012).

VR is also used in flight simulation for the Air Force for pilot training. The simulator would sit on a hydraulic lift system that reacts to the user inputs and virtual events. When the pilot steers the aircraft, the module turns and tilts accordingly to provide haptic feedback. The flight simulator can range from a fully enclosed module to a series of computer monitors providing the pilot's point of view. The most important reasons for using simulators over real aircraft for educational purposes are the reduction of transference time between land training and real flight, safety, economy and absence of pollution (Dourado & Martin, 2013). By the same token, virtual driving simulations are used to train tank drivers in the basics before they are permitted to operate the physical vehicle. Finally, the same goes for truck driving simulators, in which, for example, Belgian firemen are trained to drive in a way that prevents as much damage

as possible. As these drivers often have less experience than other truck drivers, VR training allows them to compensate and overcome this. In the near future, similar projects are expected for all drivers of priority vehicles, including the Police.

As noted before, VR is also being used for educational and training purposed in the medicine. Medical personnel are able to train through VR to deal with a wider variety of injuries than would otherwise be possible. In an experiment whose subjects were 16 surgical residents eight of them performed laparoscopic cholecystectomy via VR. They completed gallbladder dissections 29% faster than the other group (Moro et al., 2017; Seymour et al., 2002). With the increased commercial availability of certified training programs for basic skills training in VR environments, students can familiarise themselves with necessary skills in a corrective and repetitive environment. VR is also proven to help students familiarise themselves with general skills, those not specific to any procedure.

Further, VR application was used to teach road crossing skills to children. It proved somewhat successful; however, it is possible that students with autistic spectrum disorders may be less able to distinguish virtual contexts from real ones after such training. As a result, there is a risk they may attempt dangerous road crossings (Ridene et al., 2015).

The described applications of VR in education can be transferred to training future teachers. For example, simulations of a teaching/learning experience could be developed, where student teachers would be interacting with virtual learners in the form of artificial intelligences (though such a sophisticated software has yet to be developed). However, virtual classroom applications are already available, where teachers and learners can undertake distance learning within an immersive digital learning environment that creates a feeling of true presence for the teacher as well as the learner. This is bound to revolutionise the way we view and understand distance learning. The Immersive VR Education organisation (Ed tech, 2017) states on their webpage:

> Virtual Reality has been used for training and education for many years by the military, law enforcement, research labs and even NASA. Only now has the technology become available for the average consumer as mobile phone technology has driven the price of a headset down from many thousands of dollars to a couple of hundred dollars. Advances in home computing has also had a major effect as they get faster and less expensive they can now provide realistic simulations through computer generated graphics that only 10 years ago would have seemed impossible. These reasons are why virtual reality has not been used in education until now.

As mention above, VR technology can enable teachers to control and adapt pedagogical situations and this could be done in careful consideration of individual learning needs. In this case VR technology would incorporate a dynamic learner profile (Arnaldi et al., 2018) that would be able to detect errors in the behaviour of the learner and adapt its systems to facilitate a corrective learning experience through targeted assistance or feedback for incorporating reflexive learning. This would enable the learner to reflect on the experience and to learn from it. Another aspect enabled by VR technology to support learning is the controlling of learning scenarios. Specific learning scenarios would be orchestrated to facilitate development of new skills and knowledge by controlling the learning process. Currently developing such scenarios is very costly with a lot of programming needed and possible requirement of an A.I. (artificial intelligence) system that may be hard to sufficiently develop.

Nevertheless, a few companies exist that have taken up this challenge. The EMISSIVE Group (2018) developed an approach called HUMANS (Human models based artificial environment software platform) that is character focused and has the capability to create a multitude of situations where sometimes no ideal solution is available (Arnaldi et al., 2018). The system provides the freedom to take actions for the learner that will engage with preselected situations and learn from mistakes made, while it also provides

a high and effective level of control for the facilitator of the scenarios to guarantee targeted learning. The scenarios are developed consistently so that the learner can regard them as self-explanatory while the system provides for variation in the experiences. The virtual characters are independent, allowing the system to be flexible with programmed emotions and diverse personalities and social relationships (Arnaldi et al., 2018) in order to be able to disrupt, collaborate or compromise with the learner. The availability of such a system for this research would be invaluable, as it would enable the development of controlled play scenarios for teacher to interact with, and ethical challenges would be greatly reduced, due to no need for the researchers to have direct contact with the children. Furthermore, the part of the system that generates the scenarios diagnoses the learner's dynamic profile through incorporating Vygotsky's (Connery et al., 2010; Vygotsky, 1967) social-cultural learning model, familiar to teachers in NZ as the zone of proximal development (ZPD).

Another system also developed by a French company is IRISA's (2018) #(FIVE,SEVEN) approach. This approach has developed a reactive and collaborative environment where the scenarios are pre-set. It supports real and virtual users to manage the scenarios and is based on a model that that uses dynamic roles.

Few research projects will have access to such sophisticated approaches, hence this thesis is offering a training and research methodology that is more widely available, such as the immersive video (a form of VR) methodology proposed and demonstrated in this thesis.

The potential possibilities of VR are clearly numerous, and some of them have already become reality. A multitude of research papers in the last few years have investigated the application of VR technology for educational purposes; however, VR technology applications specific to the ECE sector are very limited in comparison to the use in other educational sectors. Because of the substantial development in physical and psychological development in the preschool age, ethical risks are substantially higher

than with the older groups, specifically as scientist are not yet sure how the use of VR technology affects brain and eye development in the early years, although there is some limited research addressing the use of AR with preschool children (Yilmaz, 2016). The use of VR technology for preschool teacher education and training, however, has not yet been explored and is in the scope of this thesis.

I have given an overview of Virtual Reality technology through its history, and shown how it presences itself in its *Enframed* form in different industries. At this point I could have decided to look at ways in which I could "order" the technology to bring forth play to me to use it for my own agenda. However, if I did that, I posit that the result would be engulfed in not one, but two membranes of elusiveness, one emanating from VR and the other from play. I will hence take a different route and investigate VR technology ontologically, phenomenologically and metaphysically. Rather than follow the status quo of the *Enframed* system, described before, and endeavouring to investigate a ludic illusion of a phenomenon, I have called on the "saving power" of the technology and will apply its *poiesis* to play in the hope that it may aid in a revealing of *aletheia* (truth) for both play and VR, rather than result in the ordering or stockpiling of either for a specific limiting agenda.

4.6.4. Ontology of Virtual Reality

I will start this metaphysical investigation of Virtual Reality by investigating the two poles of reality and virtuality. This will be followed by an investigation into the multiple realities of VR and concluded with a focus on understanding how manipulation and the freedom in the VR environment operate.

4.6.4.1. Reality versus Virtuality

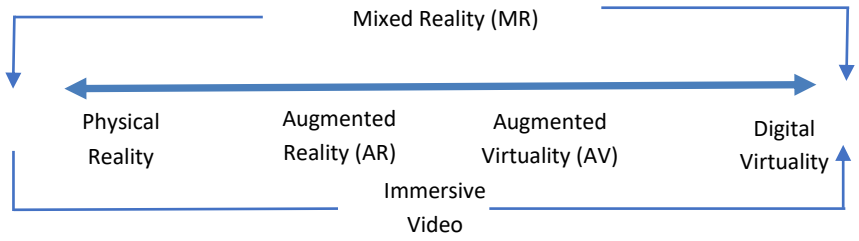
Any perceived reality can be positioned at a certain point on the reality continuum (Kishino & Milgram, 1994). The ends of the reality continuum scale are marked by the real environment on one end and the virtual environment (VR) on the other. The real

environment in this case is being perceived and experienced first-hand without any digital intervention, while the virtual environment is fully constituted of digital data.

The space in between the two extremes is referred to as mixed reality (MR) which, as the term suggests, consists of an environment that has both a digital and a real-life layer. When the predominant real environment is overlaid with digital objects it constitutes a subclass of mixed reality known as augmented reality (AR). A prime example of AR is Pokemon Go (Weinberger, 2018), where the real environment gets a digital addition of a computer-generated animation overlaid on the screen of a phone or tablet. Google Glass that generates digital data and imagery on a see-through lens in front of an eye is another example of AR (Campos et al., 2011). The other end of MR is inhabited by AR's lesser-known cousin, augmented virtuality (AV), which is defined by a predominantly virtual environment that gets a layer of the real environment administered to it. A good example of this is the way HTC Vive Pro, which has two cameras installed at the front of its head-mounted virtual reality (or, how more precisely in this case, mixed reality) device and projects outlines of the real environment in the virtual environment when the user gets too close to the end of the predefined safe movement space (Newman & Chacos, 2018).

Virtual reality environments can be erected artificially into digital constructs, but they can also come into existence by capturing representations of settings from the real world with immersive videos (Richir et al., 2015). For the purpose of this thesis, a greater focus on the latter is relevant. Immersive video recordings enable views in all directions (360 degree recordings), can provide the depth of view (stereoscopic 3D recordings) and enable control over the environment through manipulation (Trindade et al., 2013a). These properties specific to the new visual tradition mark the key advantages it holds over traditional video and photographic mediums (Pujol-Tost, 2011). If we consider the layout of the reality continuum, we could define Immersive

videos as a representation of the real environment that has been digitised into a virtual environment.



Picture 2: The Reality Continuum

This will be explained through an example of a bridge going over a river represented by several different pictorial traditions. Written text would portray the setting with words: different writers would use a range of sentences with a high level of subjectivity in representing the truth. The perception of this reality for different readers would also differ marginally depending on the individual's interpretation of the text. Consequently, if we had several writers describing the setting with several readers interpreting their work we would end up with multiple realities and with at least two levels of subjective truths. This correlates with Husserl's (1999) idea of reality, where he suggests that multiple worlds offer multiple truths from individual subjective perspectives. Arguably, drawings and paintings might diminish some of the subjectivity if the pictorial representations are "realistic". Drawings with lead pencils might leave colour to interpretation. Drawings, paintings, photographs and videos show the observers only the angle the author has chosen, hence still concealing several truths and imposing a high level of bias. With video, the viewing angles can change but are still in the control of the person recording. Both photo and video add to realism by arguably capturing more realistic illustrations than drawings and painting, while the subjectivity of the author decreases. In these traditions, the level of manipulation is very slim. A painting

or photograph can be turned around, looked at more closely or from further away, and a video can be paused, rewound, and fast-forwarded.

The control over viewing angles and manipulation increase drastically in VR (Dourado & Martin, 2013). Not only is there a highly accurate representation of the viewed image as in photographs and videos but the viewer is able to control the view point in every direction and perceive the depth of view which lifts the observer into the third dimension, creating a much higher accuracy in the representation of reality. Here the observer would feel as if he or she were standing in front of the bridge; they could observe the river flowing from underneath it, turn around and look at where the path behind leads to, walk to the bridge, or bend down and look at the gravel on the road. Nevertheless, immersive videos are not without limitations (Heim, 1993; Richir et al., 2015). Walking distance is confined to the view area of the camera and therefore its placement introduces a level of author bias. Manipulation within immersive videos is impaired in relation to digitally constructed virtual worlds, comparable to the difference of the level of manipulation in videos and video games. This means that we could observe the bridge, walk over it but we could not alter it, as it was pre-recorded. If it was digitally constructed it could have been a drawbridge that could be pulled up.

This example highlights some of the complexities of different pictorial traditions in relation to truth when perceiving realities. VR adds to this complexity significantly as its goal is to simulate or re-create reality (Arnaldi et al., 2018).

The term “Virtual Reality” is contradictory in and of itself, as “virtual” means something that is not physically existing or something that is close to the truth but is not the truth itself (Heim, 1993). As we can see, hear, touch and interact with both the real and the virtual worlds, hypothetical questions emerge about how “real” the virtual world is, compared to the physical. This thinking also raises further questions, such as whether virtual worlds should continue to be considered mere representations of reality

or if they have become something more. These questions can be addressed very differently depending on which school of realism we pose the question to.

The philosophical theory of convergent realism defines realism depending on the presence of the mind in the world (Aronson, 1997). It deems a world "real" if it can be argued that the world still exists even if the human mind is absent from it. One of the features of virtual worlds is that the user can "visit" them with their mind and leave when desired. The computer simulated world is still in existence, running on the machinery it resides in, but which the mind is not "logged into" at that point in time. Aronson (1997) further argues that it is questionable whether the notion of a mind-independent-world is a necessary feature of realism, for there is a distinction to be made between "truth realism" and "object realism". Hence, from the perspective of object realism, the virtual world is "real". This brings us to the notion of truth.

From a philosophical perspective, VR attempts to change the user's perceptions of truth by offering worlds constructed by humans or in some cases machine while giving the designers the role of an omnipotent entity within the designated world. From this perspective, VR worlds can be seen as embodiments of verisimilitude, a falsehood that seems real by having the appearance of a true reality (Renardel de Lavalette & Zwart, 2011). This must be seen in the light of the purpose of VR being to mimic reality (Heim, 1993; Sharma et al., 2015).

Current authenticities of verisimilitude are being explored in relation to the question of whether the inquired, complete empirical truth, which in the case of VR is reality itself, is known to the researcher in such a manner as to allow them to be able to descriptively assess how close the false (arbitrary) truth is to the true reality. We can identify the "truth" in VR as the real-life world, and the different VR worlds can be investigated. Therefore, by determining similarities and distinctions (non-referring propositional variables) between the real-life world and certain individual virtual worlds, we can determine the level of verisimilitude. Another way to determine the "distance" between

the complete truth and arbitrary truth is to apply a practical test to measure the success of both theories. Based on this thinking, truth in VR would be accomplished when it is indistinguishable from the real world. Immersive videos are recordings of the reality that are being played back in the virtual world; therefore, arguably, if the viewer perceived it as true that would make it true in fact. This corresponds with the phenomenological definition of truth where subjective and intrinsic truths of individuals or groups are deemed as accurate representations of reality (Merleau-Ponty & Landes, 2012). Technology is not yet capable of creating such a similitude, but it is rapidly closing the gap (Pujol-Tost, 2011).

Heim (1993) posed these questions as well. He has noted that people shy away from the "R word", even though reality was previously the key word of philosophy. When virtuality is talked about in contrast to reality, Heim in his search for a word which can adequately counterpoint "reality" settles on "artificiality". He touches on the ideas of a few philosophers, particularly their sense of the real. While some of his interpretations could be challenged, he nevertheless raises relevant ideas about reality in VR. He mentions Plato's views of "ideal forms" as reality and notes that VR could be deemed real as it tempts viewers with the allure of a perfect world. Similarly, he positions Aristotle's view of reality regarding substances we can touch as relevant, as VR technology can make us believe we are touching things with the force-feedback glove. However, it is questionable whether Aristotle would deem digital data of an object equivalent to a physical object. The symbolic significance of what is "real" - predominant in the medieval period - could be comparable with virtual symbols portraying presentations of reality. In the view of the Renaissance thinkers, the real was determined by the ability to count and observe objects repeatedly with our senses, which can be achieved in VR, although objects constitute digital data rather than physical matter. In the modern era, "reality" connotes atomic matter that has internal dynamics or energy. This sense of reality does not apply in virtual worlds, as the objects

we are seeing are graphical representations made up of digital data, unless we ascribe the attribute of "real" substance to a datum itself in its electro-magnetic existence.

Heim (1993) notes the link between cyber space and virtual reality: "Cyber space can make breaking through the interface (a human user connects with the system, and the computer becomes interactive) possible and inhabiting an electronic realm where reality and symbolised reality constitute a third entity - Virtual Reality" (p.78). As mentioned earlier, Heim even goes so far as to call VR consensual hallucination inasmuch as VR systems use cyberspace to represent physical space.

A year after Heim published *Metaphysics of Virtual Reality,* Coyne (1994) responded to his work with a paper speculating on the implications of representations in VR from the perspectives of different theorists with a specific focus on Heidegger's views. Heidegger's concern for the extremes in technology was great and as VR aims to capture reality itself - and there are few extremes that currently measure up to it - it is thought that he would regard it with disapproval (Heidegger, 1996). He was also concerned about the author's bias in representations of reality which has already been discussed. Coyne (1994) focused on Heidegger's notion of the tension between correspondence and the social construct that underlaid the workings between truth and reality and mirrors the relationship between subjectivity and objectivity, hence his ideas about truthful representations indirectly addresses "VR's quest for realism" (Coyne, 1994, p.69). Following from this, Heidegger's concept of disclosure becomes relevant, insofar as it is more concerned about the truths which constructs (in our case the virtual world) disclose, rather than how close to reality the representation is, meaning that the message carried in an immersive video is more important than the sense of reality it provides. Another Heideggerian dualism that is relevant for VR is the contrast between earth and the world, where the earth is presupposed as the real-life reality and the world as the constructed virtuality (Coyne, 1994; Heidegger, 1996; Wallach et al., 2012). He stresses the difference between these and the clash between

the realised materiality of the real world and constructed order. Heidegger suggests that it is this tension that provokes research. It could be argued that this tension is very much apparent for researchers of VR, who are hoping to close the gap between reality and virtuality, measuring and speculating the distance between truth and verisimilitude in form of the thickness of the cybernetical looking glass between the real and virtual worlds. Coyne (1994) expressed this reality shift with an example of his own: "The VR experience is not like walking through a building – we can fly through it, pass through walls, and shrink and expand the building around us," (p. 71).

From a phenomenological perspective this statement sounds a lot like eidetic transcendence, where a strong detachment of spirit from the body is required, which arguably enables significant transparency of the intrinsic truth drawn from experiencing phenomena (Merleau-Ponty & Landes, 2012). Merleau-Ponty & Landes (2012) also state about truth:

> Truth does not merely "dwell" in the "inner man"; or rather, there is no "inner man," man is in and toward the world, and it is in the world that he knows himself. When I return to myself from the dogmatism of common sense or of science, I do not find a source of intrinsic truth, but rather a subject destined to the world (p. IXXIV).

Heim portrays VR as an "event or entity that is real in effect but not in fact" (1993, p.109), again highlighting the dichotomy between reality and virtuality. This notion of Heim's is demonstrated in a function of VR this thesis refers to as "The Dinosaur Effect". Subjective truth is determined through bodily senses, and the purpose of VR is to deceive our senses to perceive a virtual truth as reality. We all hear, read and try to imagine how large the prehistoric animals were and while text, picture and video can conjure up an abstraction of this perception, it is VR that can produce a concrete account that can be felt cross-modally and multi-sensorily by immersing the participant in the event. The effect on most people is staggering, drawing out involuntary

reactionary movements and shouts. After the experience, people usually comment that they could feel it breathe into their face, while they were struggling to comprehend the enormity of the creature before them. Arguably if VR can cause a real-life bodily reaction and feelings such as fear, amazement and excitement in adults, they must at some level perceive it as some sort of truth. “The Dinosaur Effect” is also supported by the embodied cognition theory, according to which a significant sensory experience always induces a motor response (Varela et al., 1991).

The perception of reality and truth in the VR world is important when constructing a VR methodology as it contributes to articulating the effectiveness of the VR device in representing experiences in VR.

4.6.4.2. The Multiple Realities of VR

While many people are aware of the concept of three dimensions and a few are familiar with ‘time’ representing the fourth dimension, dimensions five to ten are rarely discussed (Williams, 2016) as they are not something that affects our everyday existence. Dimensions five to ten cover aspects such as alternative worlds, possible worlds, clusters of realities as well as the tenth dimension wherein everything is theoretically possible. In contrast with physical reality where we are not able to exert any influence on the dimensions four and beyond, this is not true for VR. Therein, we can manipulate time by pausing the world, and wind it backwards or forwards, which also applies to immersive videos. In digitally constructed virtual worlds we can additionally visit different possible realities by winding time back, thereby making different decisions that will affect the circumstances of a future reality. This theory’s relation to education might sound ludicrously distant, but dimensionality in VR represents the “infinity of possible” and hence provides users with unlimited possibilities to learn. For example, it can demonstrate how a single decision can change the reality of a whole world ultimately forcing the user to realise the power they hold over their own and others’ realities.

This is also something Heim thought about. What is here described as "dimensionality" illustrates a metaphysical view of the properties of the universe. Similarly, Heim (1993) envisions this in the context of a higher, esoteric, metaphysical plane of existence. He presents a Taoist legend as a form of premonition of a time where VR and its capabilities exist:

> This ancient story, adapted from a Taoist legend, anticipates the metaphysics of virtual reality. On one level, the story praises the power of artistic illusion. On a deeper level, it suggests our need to create realities within realities, to suspend another. The story depicts our ability to enter symbolic space, where we move about in alternate worlds (p.129).

Later, he refers to quantum theory and notes that now, with science open to diversity and indeterminateness, many philosophers welcome the world as a plurality.

When he talks about the design of the virtual world he also notes that there is no need for us to limit ourselves to a single existence in a single reality and suggests that worlds could, perhaps, be layered like onion skins. A similar view is offered by the theory of embodiment which states that consciousness is taken not as a part of the world, but as the constitutive presupposition for experiencing any world *(Internet Encyclopedia of Philosophy*, 2017).

In practice, and in relation to this research, this means that the teacher is now able to "control time", which enables the re-view of an experience multiple times, at a later stage. This creates another intrinsic, subjective, alternative reality on each occurrence within the dimensionality of self.

4.6.4.3. Manipulation and Freedom in VR

To be able to fully interact and affect the virtual world, a level of direct manipulation of its artefacts, structures and properties is needed. However, this concept highlights

the current inadequacy of mainstream VR technology, with the input devices available for the general public limited in application. While the more expensive models of VR devices with the help of some additional trackers can enable full body tracking of the physical body, in reality for projection of these movements into virtual reality, more development refinement is needed to ensure a high level of physical immersion. Furthermore, if we pick up an object in VR we are unable to feel its surface texture or temperature without a sophisticated full-body haptic suit which is not yet available for general use. These inadequacies limit manipulation and to some degree impair the immersive experience.

Recently Sony has put in a patent for a glove that would overcome some of these restrictions:

> The trademark encompasses a flex sensor to record finger movement, a pressure sensor to track if the user is touching a surface, and a module that relays said feedback back into the VR experience. Sony's wearable concept would allow the virtual gloves [to] be worn by multiple users in a multi-user game. In such an implementation, users collaborating may use their gloves to touch objects, move objects, interface with surfaces, press on objects, squeeze objects, toss objects, make gesture actions or motions, or the like (Briers, 2016).

Even more recently a haptic suit has been developed named Teslasuit (Teslasuit Inc., 2018) by the company carrying the same name as their product. In an interview, they advised that their suit is going to be available to the public next year for a price of a top end gaming console, suggesting that it is going to be "relatively" affordable for the leap in technological advancement. The company has been nominated for the CES 2019 innovation awards. The suit incorporates features such as haptic feedback that transmits exact haptic sensations from virtual worlds to your body through electrical impulses, motion capture that tracks the bodies movements in the real world and translates them into the virtual one, a climate control system that supplies digital environment

temperature change, and a biometric system that collects the engagement metrics and biometry patterns. This innovation illustrates the rapid advancement of the VR technology to enable immersion and manipulation in virtual worlds.

The concept of manipulation in, and of, virtual worlds is imperative for freedom. Without the ability to manipulate space, activity within any inhabited digital space could be compared to possessing a physical disability in the real world, which can ultimately limit the affected person's interaction and involvement.

Husserl (1999) also talks in his phenomenological investigations about the importance of freedom gained by the ability to feel and move, and he emphasises that the lived body functions centre a person to the "here", from which point several spatial directions and distances are observed. He also stresses the importance of the capability of self-movement through opening up a rich range of practical opportunities reliant on distinctive sorts of directly felt sensations such as the experience of tactile contact.

Heim (1993) does not talk a lot about manipulation in VR as a discrete concept but has included it in his discussion of interaction. He does, however, mention the 'dataglove', the description of which closely resembles Sony's patent discussed above. Heim argues that it would enable the user to become an active, involved force in the digital world. He also stresses the importance for the users to be able to be "touched" by digital entities as well as discussing the manner in which manipulation and sensitivity must work together to best achieve verisimilitude. He also noted the importance of manipulation and hand-eye coordination in VR in order to enhance receptivity for the future of VR as a training tool.

Manipulation in VR offers immersive opportunities for empirical research, even though, in this research, this concept is likely to be severely inhibited due to the nature of immersive videos, i.e. being a pre-recorded experience that cannot be altered or physically interacted with. This is the key limitation of this research, as creating a

specific interactive digital ECE environment would need significant resources, professional labour, equipment and funds. What teachers are able to manipulate regarding immersive videos, however, is time as well as the view direction.

Considering that over two decades have passed since, it feels appropriate, though ironic, to conclude this section with Heim's (1993) proposal: "If for two thousand years, Western culture has puzzled over the meaning of reality, we cannot expect ourselves in two minutes, or even two decades, to arrive at the meaning of virtual reality," (p.43).

As immersive videos as a form of VR were used for this study, they will be explained in the next section.

4.6.5. Immersive Experiences in VR

Immersion is one of the main benefits of using VR technology and provides a characteristic point of difference in relation to traditional video technology. Revisiting educational scenarios through immersive representations of first-hand experiences in the virtual world is possible with the use of recorded immersive videos.

Immersive videos are recoded with an omnidirectional camera that captures all view angles (360 degree) and enables a stereoscopic (3D) perception of depth. The user of a VR HMD can view these video recordings repeatedly through an immersive virtual experience of the digitised environment. Audio is usually transmitted to the user via stereo headphones that simulate a 3D audial environment that, along with the visual experience, provides a cross-modal and multi-sensory experience that significantly increases the immersion factor. Currently a number of haptic suits are in development that will add further modalities to the immersive experience. For example, the Tesla suit adds the modality of touch through haptic feedback and temperature through its climate control system (Teslasuit Inc., 2018). Some technological developments also engage the sense of smell, taste and motion to enrich digitally included immersion even more (Naimark, 2018).

The level of immersion is directly linked with the quality of the perceived experience and the power of the effect the experience has on the user (Babu et al., 2011; Trindade et al., 2013b). In the case of this thesis the level of immersion would determine the effectiveness of the virtual experience in inducing changes in the conceptions of the teacher learners. The level at which the sense of reality and truth is being experienced in VR will also depend on the quality of immersion. Hence, the next section will investigate how the level of virtual immersion corresponds with changes in cognition, by drawing from already investigated findings about how people perceive experiences in VR and how these can cause changes in conceptions. This notion is going to be investigated through the phases of embodied cognition from the inception of a learning experience to its conclusion, through the act of "seeing" in the form of an engagement of the mind with the (virtual) world through its body, to the act of "becoming" in the form of perceived changes in the individual's cognition manifested as alterations in subjective attitudes, beliefs, conceptions and the perception of truth.

5. Immersive Video as a Research Method

Developing a methodology that takes into account *Enframing, poiesis,* learning form experiences and embodiment theory is all very well in itself, but it is enriched with phenomenological application. For the purposes of this thesis, such application concerns the problem already asserted concerning the enframement of play in ECE. This chapter therefore addresses the research method developed from the immersive video methodology above. I explain the immersive video approach to research followed by the research design and analytical processes and procedures. The latter includes an in-depth explanation of the analytical framework that was custom designed for this thesis based on the methodology. The role of the researcher and ethical considerations is addressed at the end of this chapter. Together, they set the scene for the metaphysical laboratory in its application – in seeing through the looking glass that is accessible through this phenomenological route.

The method developed situates itself in the metaphysical laboratory in the virtual space, and draws from the phenomenological underpinnings of the embodiment theory and the pedagogy of experience, while taking advantage of the affordances of VR technology. Just as the embodiment theory brings together the phenomena from the world, the mind and body, this method will stimulate bodily senses to simulate a virtual world with representations of play experiences (phenomena) to the subjective minds of teachers. The learning experiences of teachers will be closely monitored with the use of the developed analytical framework named conceptual processing described below.

5.1. Role of the Researcher

I had multiple roles in the empirical part of the research, such as the video recorder, video editor, interviewer, analyst and interpreter. I recorded the immersive videos with the VUZE camera and the video of interviews and the observation of the engagement of the teachers with the VR device with a traditional digital camcorder. Observations

in this study were informal as the researcher was non-participatory and the camera was the instrument. A certain amount of bias was involved: as noted, I pasted the immersive video together based on my own understanding of what constitutes play in ECE. Further bias was possible in the data analysis process where I decided which parts of the videos of teachers I deemed to correspond to a certain conceptual analysis tag. Phenomenological research is value laden and non-objective by definition, hence the fact that the data was developed from the interpretations of the researcher is justified.

5.2. Analytical Framework - Becoming Through Pedagogical Immersion in VR

To analyse data gained from the interviews and video observations of participants, an analytical framework was developed. I acknowledge that the procedural nature of the framework attempts to frame the human experience to inform the researcher whether the experience was successful in achieving *poiesis.* Such framing goes against what the thesis is advocating; however, to be able to present the results in an academic tradition, it is required. But, as I am conscious of this framing, its effect can be accounted for and minimised. The explained methodology in Chapter 4 heavily informs the following analytical framework that was developed based on embodiment theory and the pedagogy of experience.

The main question being asked in this thesis is whether immersive video methodology can serve as a virtual looking glass to enable teachers to "see" children's play in the curriculum in such a way that they are able to develop alternative insights about the phenomenon. In response I employed the above methodology to develop an analytical model for determining if the experiences in VR progress through the stages of embodied learning from experiencing. Hence, for this research to be able to determine the changes in cognitive conceptions in subjects that resulted from the exposure to the experiences in VR, this alternative model of becoming has been developed.

The theoretical notions discussed in this section provided the base for the analytical framework used in the new methodology. This section also serves as an intersection where theories of learning meet with conceptions of virtual immersion. It is at this point that phenomenology and science cross paths in this thesis, not only with digital and technological sciences but also the cognitive and neuroscientific aspects as suggested by Merleau-Ponty & Landes (2012). This analytical framework engages with the continuity of conceptual processing, describing the process of engagement of a subject with an experience from its inception until its end. The process explains how the experience affects the subject's mind, even, if only subtly, creating a new kind of person (Dewey, 1986). The model draws on the fact that inner perception cannot be conceived without the external perception (Kant et al., 1996), the part that experience plays in developing a continuity of knowledge (Dewey, 1986), the function of the embodied mind in reconceptualising inner truths (Varela et al., 1991) and the properties of embodied cognition (Coello & Fischer, 2015; Fischer & Coello, 2016).

The following framework presupposes the existence of a phenomenon that is to be discovered/unveiled through an experience that reveals some truth about the phenomenon and hence re-conceptualise the subject's knowledge. The framework consists of eight consecutive stages, which will be examined in both the physical and virtual world.

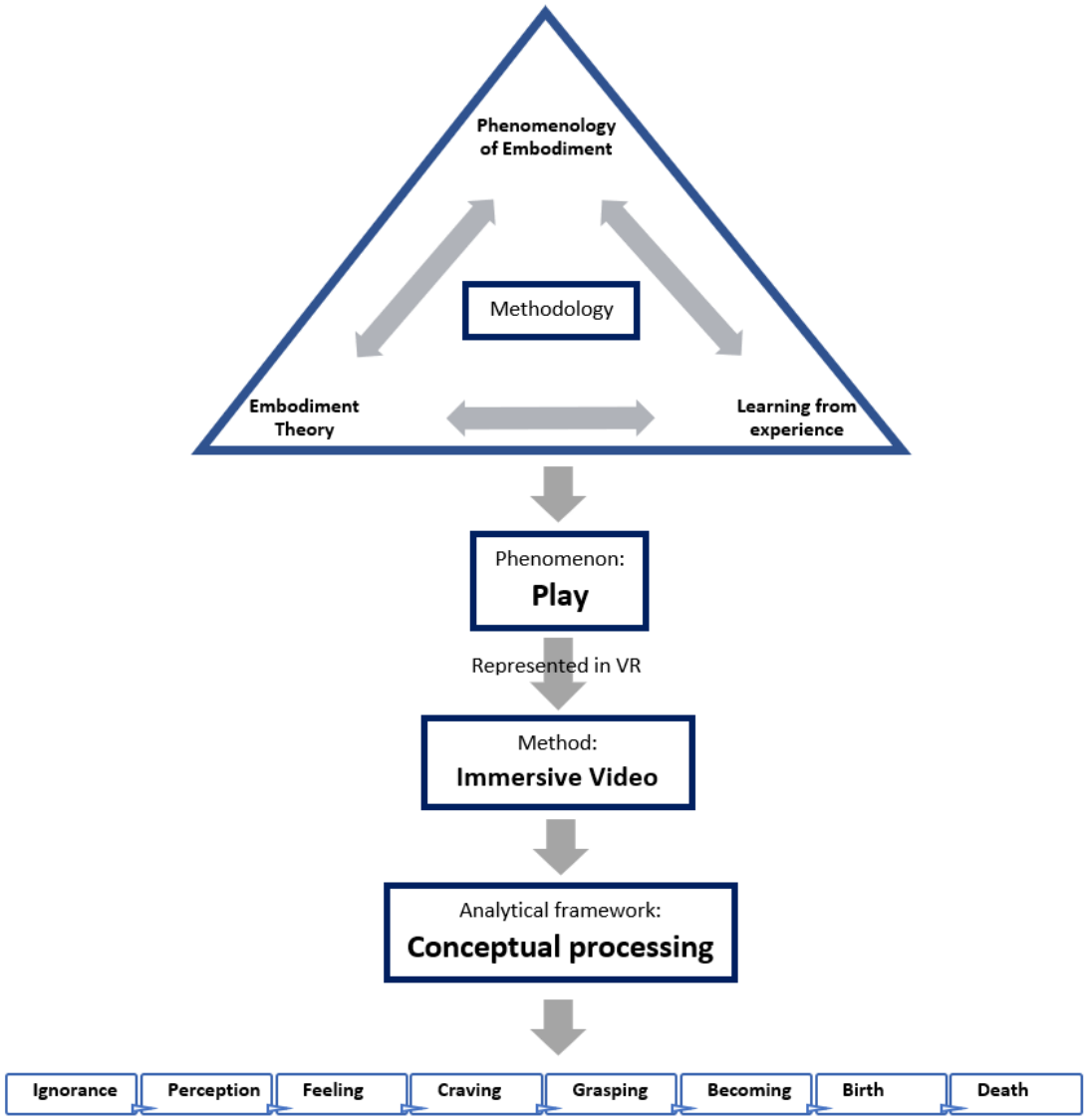


Figure 2: A Representation of the Analytical Framework of Conceptual Processing

5.2.1. Habit / Attitude (Ignorance)

This stage is determined by the point in time before the experience has made contact with the senses of the individual. Unable to grasp a certain truth about a phenomenon to sufficiently know about it, the person is in a state of ignorance regarding the

phenomenon (Varela et al., 1991). This stage is also characterised by confusion, erroneous views and emotions that derive from ignorance and the lack of ego-self, resulting in habitual repetitive actions. Dewey's (1986) principle of "continuity of experience" regards such habits as biologically conditioned, which highlights the need for an understanding of a co-dependency between science and phenomenology. He argues that every experience will in some way change how further experiences are going to be perceived and calls this a change in habit. Therefore, the starting point of every experience is found in the current habits of the mind. Habits are the harbourers of attitudes both intellectual and emotional (Dewey, 1986). In line with this research we could refer to the union of habit-attitude as a conception of the mind that an experience is set to alter. In concrete terms an individual teacher will maintain certain attitudes about play that are based on the habits of the mind – ways of thinking evoked by the current state of cognition (ignorance) about play. If we are to follow Dewey's thinking, an aligned moving force (experience) will inevitably affect the conception and alter it in some way.

Because this phase of the theoretical model occurs before the experience has started, no contact has yet been made with either the physical or the virtual world, hence for the subject the outcomes of this stage are the same in both environments, and the individual will occupy the physical or the virtual world with the same frame of mind. In relation to this research this stage will ascertains the teachers' initial attitudes, habits, knowledge and understanding of play by analysing the assessment and planning documentation of individual teachers and by discussing their initial state of mind at the interview stage of the research.

5.2.2. Contact with the Senses (Perception & Motor Response)

This stage takes place when the experience is being perceived through the senses of the body. For a conception (attitude & habit) in a human consciousness to change, the unity of body and mind is a prerequisite. Conceptual knowledge remains associated with the

sensory and motor features of the body present during acquisition (Fischer & Coello, 2016) of the experience. Each sense will contact its sense field (modality). While the modalities in the physical world are not going to be limited, the ones experienced in the virtual world are determined by the capability of the device being used. In most cases fewer modalities will be experienced in the virtual world than in the physical world. This highlights the first discrepancy between experiencing phenomena in the two distinct learning environments, which will need to be considered with any empirical application; hence, the different modalities perceived in VR are going to be further investigated in this section.

As mentioned before VR technology brings with it the capacity to indulge multiple senses cross-modally (Mitchel & Weiss, 2011), because it processes several input and output streams of different sensory modalities. The audio output stream caters for the human sense of hearing through the mode of sound. This reaches the user through either headphones, earphones, or speakers. Sound plays an important part in providing immersion in VR; therefore, it needs to be accurate, of good quality, timely and approaching listeners from the appropriate direction. Consequently, a perception of 3D surround sound is required that can be achieved by simulating it in stereo mode (two audio streams) or reproduced more precisely through several audio streams from multiple directions for a higher level of immersion. Handling the visual modality via video streams is even more complex. Not only do the video streams need to be in perfect unison with the sound streams; they also need to be able to provide a high enough quality picture, a low frame rate where the speed of pictures frames changing is high and a sense of 3D depth, which is handled through the duality (stereoscopics) of the video stream where one is allocated for each eye. The picture also needs to respond to the movement of the head and with some devices movement of the eyes, with the help of one of the input streams of the technology that transfers information through head-tracking and eye-tracking capabilities of the system.

These output streams affect the user simultaneously and therefore function cross-modally (Mitchel & Weiss, 2011) and as they stimulate several different senses, their effect can be described as multi-sensory. Real-life experiences are based on cross-modal multi-sensory experiences generated by the physical world and these affirm our body with a sense of presence in the perceived space (Seymour et al., 2002). To move the presence of the user from the physical space to the virtual cyberspace, the user's senses need to be deceived with computer-generated, streamed stimuli in a way that is the same or similar to real-world sensation, as virtual space is a simulation of the physical one. Therefore, VR technology needs to be able to recreate or simulate a cross-modal multisensory experience if the user is to feel immersed into the virtual world. From the viewpoint of embodiment theory it could be argued that through this technology we endeavour to transport the human mind from the physical existence into a virtual one by convincing the senses that virtual representations are real. As this is also something that can be measured in some way empirically it is an important point for this study that the more effective VR technology is at reproducing modalities and the more senses it satisfies the stronger the immersion it creates. Through this, the effectiveness of a VR device can be measured by having the user describe to what level which senses have been engaged and how strong the immersion they experienced was.

Theoretical similarities can be drawn to the work of Dale, Kant and Dewey, discussed previously, to further explain the importance of cross-modal multi-sensory immersion for effective learning through experience. As we are able to simulate a representation of real-world experiences, we can arguably engage the human mind and body in learning through multiple sensory "virtual-life" experiences that may enable holistic and meaningful learning, which relates to Dale's model of learning from experience and Dewey's theory of learning (i.e. the model which best resembles real life experiences) with further correspondence to VR technology's goal of simulating real life. Furthermore, learning through VR technologies can be associated with the common theoretical beliefs of these philosophers outlined earlier: the senses are being

strongly engaged in VR; VR has the potential for novelty as it can "materialise" anything imaginable; the reactions accompanying the "dinosaur effect" suggest that emotions are present; VR can refer to previous experiences had and create a sense of personal achievement through meaningful learning in the virtual world.

As pointed out, a high level of immersion in VR is the main purpose for including the cross-modal and multi-sensory studies in this research. Heim's (1993) ideas about immersion correlate strongly to findings about cross-modal and multi-sensory experiences. In relations to this, he focuses on the technology and its peripherals, such as the previously mentioned HMD, tactile device and audio with 3D acoustics. He believes that VR means sensory immersion in a virtual environment where the interface between the human and the virtual space needs elaborative sophistication to enable full immersion through embodied contact. Without contact the body will not sense the experience.

As the sensory and motor systems have been biologically (evolutionary) developed together they are inseparable systems imbedded in an encompassing biological, psychological and even a cultural context (Varela et al., 1991). Due to this entanglement of the two bio-systems a concept described as embodied action occurs. In concrete terms perception and action are fundamentally inseparable in embodied cognition (Coello & Fischer, 2015), meaning that when an experience strongly arouses the sensorial system an involuntary bodily motor response occurs. The reaction in the previously described "dinosaur effect" could be categorised as an embodied action that is perceptually guided. Another function of this concept is that when the senses perceive a worldly experience, motor behaviour and knowledge representations inform each other, meaning that the experience of the outer world is entangled with the experience of one's own motor response when knowledge is being reconceptualised. This is another example of how important a scientific notion can be for understanding a phenomenological discourse. In the case of this study the embodied action holds great

importance as physical responses in the real world affected by the stimuli in the virtual one can be monitored. These reactions (embodied actions) in the form of motor responses to the sensorial stimulation generated by the VR device can be video recorded for analysis and interpretation. Arguably the data picture will illustrate points in time where re-conceptualising of knowledge is occurring, as behaviour is the first cause of all the stimulations (Varela et al., 1991).

5.2.3. **Feeling (Affection)**

This stage is twofold, as it encompasses feelings in the wider sense of the word: in the biological - the physiological feeling the senses create in our mind; and the cognitive - the affective feelings developed from the contact. Feelings can be pleasurable, unpleasurable or neutral (Varela et al., 1991). Under the influence of feelings, the subject is struck by the world, or from a phenomenological point of view we could say that the individual is thrown into the world. Heim (1993) stresses that the way VR works and affects people it can abruptly awaken the inner being of self with the combination of physiological and affective feelings transforming the core being of an individual. He uses the example of an artistic performance that intentionally engages many senses and carried a strong emotional and even esoteric message to the audience and calls forth significant physical and emotional responses from them. Therefore, the kinds of and the intensity of feelings caused by VR in this research will contribute to the outcome of the re-conceptualisation of knowledge. The stronger the effect of the world on the subject's feelings the higher the possibility for changes in conception. For this reason, feelings both biological and affective were points of discussion at the interviews.

5.2.4. **Interest (Craving)**

Dewey (1986) states that "every experience is a moving force" (p.31) insofar as it arouses curiosity and interest through a strengthened initiative that sets up desires and

purposes that are strong enough to move a person forward. The interest that arises from perceiving the experience sets a problem for the person experiencing it (Dewey, 1986); from a phenomenological view this can be accounted to an imbalance to the equilibrium of the perceived world. This feeling of imbalance and uncertainty awakens a craving to restore the balance, to bring meaning to the experienced. The basic functions of craving arises from the desire to achieve something that is pleasurable or evert what is displeasurable (Varela et al., 1991). It is important to note that until now all the stages have occurred automatically based on causality, but at this stage the human consciousness can decide to proceed to the next stage or to dismiss the experience. For reconceptualising of knowledge, it is highly important that the process continue, and this depends on the open-mindedness and curiosity of the subject.

The "craving" begins after the experience moves, changes, upsets the balance of the subject, which usually occurs right after the event played out in the environment. That would imply that craving is an internal process that would in most cases transpire while the subject is still in VR if the event was experienced in the virtual world. This stage is hard for an outside person such as a researcher to determine and would need to be investigated with the subject after the experience had concluded (White, 2016b). If the subject later confirms that an interest was initiated by the VR experience, the researcher should use probing questions to determine the effectiveness of immersion with the VR device, by establishing if the same interest would have been developed in the same way if the experience transpired in the real world. Probing for answers here would be a good opportunity for the researcher to examine, as mentioned before, the space between what occurred for the subject in VR, and in contrast to what they believe would transpire for them in the physical world.

5.2.5. **Grasping (Reflection)**

At this stage there is also an immediate aspect of agreeableness or disagreeableness and a strong influence of the outcome upon later experiences. Here Dewey (1986)

stresses the struggle within a human mind between past and present, between what our past self knows and the new knowledge that challenges our past self in the present to create a new future self. There is a possibility that the individual may reject the new knowledge or reject the past knowledge. Ideally an individual will have an appreciation of the living present where individual truth is in constant flux based on understanding the past and the process of new experiences generating new knowledge and in a way updating the individual. From a phenomenological standpoint this is the point where reflection occurs, where the process of reflection enables the change of conceptions of the mind. If reflection does not occur the experience will go to waste and the chain will be broken. Again, probing is a suitable method to investigate what reflective thought processing has occurred during the VR experience. At this point it might be important to give the subject some time to think and reflect after the experience with the VR device has been completed. Although Dewey suggest that this phase is immediate, newer research suggests that the time for reflection varies based on individuals' cognitive makeup and the type and magnitude of the experience (Coello & Fischer, 2015). Hence when researching it might be appropriate to give the subjects a break after the engagement with the event.

5.2.6. Formation of New Attitudes (Becoming & Transcendence)

Effective experiences will set up attitudes that will form a person's future self and views of the world (Dewey, 1986). Grasping automatically pulls the individual into becoming – formatting a new situation in the future. New attitudes, tendencies and suppositions are being formed because of the causality of the chain of events brought by the experience. From the view of phenomenology individual existence is not often static, but it is always in the process of becoming something new and transcending itself, with the goal of fulfilling the possibilities of the individual consciousness. Transcendence is a notion pivotal to phenomenology and is strongly linked with the concept of becoming (Merleau-Ponty & Landes, 2012). This relationship is going to be

further explored in the following chapter. The interview questions around what attitudes formed for the individual and how these are going to affect their future actions were asked regarding this stage. Investigating how traditional video methodologies would have supported the process of them becoming a person with new attitudes and beliefs in contrast to their engagement with VR technology would be suitable at this stage of discussion.

5.2.7. New Mode of Being (Birth)

The value of an experience can only be judged by the impact it has on a person (Dewey, 1986). For Dewey this concept consists of physical, intellectual and moral growth. Here finally a new situation arises that forms a new mode of being for the individual (Varela et al., 1991) who has just been woken up. This is the point where comprehension dawns and new truths about phenomena reveal themselves before the person (Merleau-Ponty & Landes, 2012). However, "birth into a situation, even an agreeable one, always has an edge of uncertainty" (Varela et al., 1991, p.115). This notion suggests that even though the experience is leaning towards its conclusion the aftermath of its causality has only begun, as changes in conception will tow a raft of circumstances, events and impressions that will need reconceptualising as well. The researcher should investigate such causalities with the involved participants.

5.2.8. Conclusion of Experience (Death)

Moments die, situations die, and so do experiences. Death is a prelude to the rebirth of an experience in a different form, for even the same experience will not be perceived the exact same way. Every experience affects to some degree the conditions under which further experiences are perceived. Hence every experience lives on in future experiences. This statement is the foundation of Dewey's (1986) principle of continuity of experiences. This finding suggests that the engagement with the same immersive video on different occasions might bring forth different or further subjective truths

about the same phenomenon. In the case of play, multiple viewing of an identical play experience in VR might deepen the understanding of play.

Similarly, Varela et al. (1991) conclude that in this cycle of causality, death is the link connecting the individual to the next cycle – the next incarnation of an experience that is waiting to illuminate another darkened corner of a person's perception of a phenomenon.

5.3. Research Design

Several ECE researchers have taken a phenomenological route and many have used video, such as Johansson and Lokken (2014), Cherrington and Loveridge (2014), White and Redder (2017) and Haggerty and Mitchell (2010). This research builds on their endeavours in visual pedagogy and crosses the boundary from the visual to the immersive research paradigm.

The research entails both qualitative and quantitative data, as both are important in phenomenological research (Denzin et al., 2006), due to the complexity of researching human experiences with phenomena and their subjective understanding of them (Lincoln, 1995). Most of the quantitative data will be gathered from the video analysis of teachers including their statements and behaviours during the interviews and their interactions with the immersive videos. Qualitative data will be informed by teachers' narrative statements.

These following processes were followed in chronological order to structure the empirical research:

- Develop ethical considerations for the research
- Select an ECE centre to do the research in
- Follow and apply the consenting process at the selected centre

- Initial centre visit: test omnidirectional camera at the site and familiarise with research environment and people there; desensitise children to the camera in the environment.
- Record Immersive videos at the side
- Edit and process immersive videos
- Conduct interviews with teachers, video record them and determine that the required data have been captured.
- Play the immersive video to the teachers at the site
- Conduct second interviews with teachers, video record them and ascertain that the required data has been captured
- Format video recordings of teachers
- Analyse videos against the analytical framework
- Generate videos corresponding to individual analysis tags
- Compare assessment documentation from before and after the viewing of immersive videos
- Create data sets
- Analyse and make sense of data
- Record and discuss findings

The above timetable is further explained in detail below.

5.3.1. Research Context

The study was conducted at a New Zealand early childhood education and care centre in the 3 to 5 year-old classroom. Four fully certified early childhood teachers (teachers with at least 2 years' teaching experience) were involved in the research. Based on the following seven criteria the researcher identified and invited one highly effective ECE centre to take part in this study.

i) In its most recent ERO report (from a Ministry of Education sanctioned review) the centre had been highly commended for providing positive outcomes for children (Very well placed – rating);

ii) its internal determinant grading of quality education and care review of quality teaching (was 3.5 out of 4 or higher),

iii) receptors of the internal TrustMark quality award for Quality Teaching, bestowed by the wider organisation to centres with very high quality outcomes for children.

iv) a centre accommodates different ages, in order to highlight the dynamics of play across age groups.

v) all registered teachers in the setting expressed interest in taking part, to ensure their voluntary consent is given

vii) Centre was not directly reporting to the researcher, who works at the organisation as a senior manager. This possible conflict of interest is further explored in the ethics section of the thesis.

The invitation with the detailed outline of the research was emailed to the centre leaders who were invited to approach ECE staff in the first instance before responding.

Once the centre had been selected, the centre leaders were invited to approach all other adults in the setting including parent/s and give them the Participant Information sheet and consent form. Care was taken to stress the voluntary nature of participation. The centre leader would have had informed the researcher of any children or teachers who were not to be part of the study, but no one opted to be excluded. (If a parent had not consented to their child being involved in the study and it would not be possible to exclude their child from the data have their child in the

data any video with that child in it would have been eliminated from the data set.) (see Appendix 4).

ECE staff were informed of the potential study by information sheets and consent forms distributed via the ECE centre leader (see Appendix 4).

5.3.2. Preparation Visit

I visited the centre once for a day some weeks before the immersive video was made. I introduced myself to the centre leader, teachers, children and parents and answered any questions anyone had regarding the research. I scouted the target classroom for the best place to position the camera. The 360-degree camera was placed in the environment for the day (without recording) for children and teachers to become desensitised – used to it being there - to minimise the effect the presence of the camera might have on participants in the study.

5.3.3. Generation of Immersive Videos

To be able to answer the research question of this thesis, immersive videos of children involved in play experiences needed to be recorded. This was done on my second visit to the centre, when I used the 360-degree camera to record immersive videos. Across a full day the 360-degree camera was generating footage based on everyday activities, routines and experiences within the centre's play-based curriculum. Children and teachers (and parents if on the premises) of the centre who were involved in this part of the study went through a thorough consent process regarding being videoed and were told how this footage was going to be used.

As mentioned before, immersive video, also known as 360-degree video or spherical video, is a form of VR, where a physical environment is digitised into a virtual environment. An immersive video recording enables a view in all directions and is recorded with the help of an omnidirectional camera or a collection of cameras. In this

research a VUZE 360-degree 3D camera was used to record play experiences. The specialized omnidirectional stereoscopic camera device that captured the immersive videos for the purposes of this research is equipped with multiple action cameras installed into a single rig.

Figure 3: Immersive video of children at play

I used a video editing programme to edit the recordings taken on the day into a 13 minute video, including a number of instances with children being involved in play experiences. The video format the video was saved in supports 360-degree-3D video playback on a VR HMD. There was some bias involved in this process as I chose experiences that I thought to be relevant based on my own views of play.

5.3.4. Interviews Held Before the Viewing of the Immersive Video

To develop a reference point for teachers' understanding, views, attitudes and insights into play I interviewed each of the teachers individually before the viewing of the immersive video. Guiding questions were used to support the conversations and a tick sheet was used to ensure that all the required information was gained. The interviews

were recorded with a traditional digital video camera to allow careful analysis of the information later and to enable comparison with teachers' insights after they had watched the immersive video.

5.3.5. Video Observation of the Viewing of Immersive Video

For playing immersive videos to teachers a Samsung Gear VR HMD was used. The viewer could control the viewing angle and was able to perceive stereoscopic depth of view which provided for an immersive experience. Gear VR is a stereoscope-style headset enclosure in which a smartphone can be inserted. This allows participants to view content in a VR format. This product emulates the operation of a dedicated HMD but utilises the display of the phone itself and its internal lenses rather than containing dedicated screens. This makes the device portable and easy to set up. I used a traditional digital video recorded to record teachers while they were watching the immersive video with the Samsung device.

Figure 4: Teacher viewing the immersive video using the Samsung Galaxy VR device

Observation in this study was informal as the researcher was non-participatory and the camera was to be the instrument. This enabled the researcher to observe how

individuals acted when using the headset and interact with VR technology. I was specifically interested in observing motor responses that might accompany sensual stimuli from the VR device. The importance of observation is emphasized by theorists who argue for the importance of learning from experience (Dale, 1970; Garrett, 1997b; Hildebrand, 2016) and was thus an appropriate method to be applied in this study. To ensure that VR technology was effective in immersing viewers into the play experiences, observation was the correct choice to interpret the underlying meaning of events and activities of VR.

5.3.6. Probing Interviews Held After the Viewing of the Immersive Video

Teachers were then given a two-hour break to reflect on what they had seen in the immersive videos, before the second interviews commenced. Reflection is a very important aspect of all educative experiences, as opportunities for learners to reflect on their experiences can help them to create continuity and meaning (Dale, 1970; Garrett, 1997b; Hildebrand, 2016; Schmidt, 2010). Reflecting on perceived phenomena is also as already noted a key component of phenomenological research. Through the second interviews I sought to discover relevant information about their engagement with VR and if and how these enabled them to develop alternative insights into play. I was very interested in finding out what these insights were and how they related to their conceptions about play before the viewing of the immersive videos. Accordingly, the form of the interviews was the same as the first: semi-structured, with some open-ended reflective questions (with some opportunities for deviation).

The interviews were also video recorded, coded and associated with the described analytical framework. As the data that derived from the interviews were based on changes in cognition/perceptions (as an effect of “viewing” or rather experiencing an evolved form of visual/video tradition) this method could be described as probing, as had been applied by White (2016b) with the polyphony approach to videos. While this

type of interview relies heavily on "retrospective reporting to elicit data about cognition on the assumption that 'humans have access to their internal thought processes at some level and can verbalize those processes'" (Cherrington & Loveridge, 2014, p. 26), it also provides the participants with opportunities to offer new insights on events or in this case experiences (White, 2016b). Probing also enabled the participants about what they had experienced in VR, contributing to understandings of the experience. This method supplies the researcher with important visual surplus where participants are exploring past experiences from an alternative viewing angle supported by visual representations and probing questions. Probing draws not only on the participants' memories of the event but also generates new cognitive conceptions in form of alternative insights based on the visual surplus and the probing of the researcher. The emphasis on cognition links this strategy to the theory of embodiment and more broadly to phenomenology. As was maintained earlier, the phenomenon of play is ambiguous in its nature and as this tool is set to reveal the natural complex world of educators, it allows them to describe their thinking, reflecting, beliefs and individual subjective pedagogical knowledge. Accordingly, it served the purpose of this research well.

The typical procedures for this tool include playing episodes of video or audio, but in the case of this study, a pre-recorded representation of an experience was created for the VR environment in the hope of propelling viewers' individual recollections of their conception of play beyond their current attitudes, beliefs and understandings. The challenge with interviews after watching videos is usually to distinguish between participants' recall of, and reflection on, the viewed event (Cherrington & Loveridge, 2014) but by using probing, in order to illustrate the change in conception, the margin between the two is going to be investigated; thus, this challenge may paradoxically prove advantages.

5.3.7. Comparing Assessment Documentation from Before and After the Viewing of Immersive Video

As noted in the theoretical part of the thesis, assessment is a powerful tool in education and as such it provides relevant research data about the perceptions of teachers regarding educational phenomena and the importance they place on certain aspects of education including standardised learning outcomes. Therefore, assessment data were also sought from teachers involved in the study.

I downloaded several learning stories (the predominant form of assessment in the New Zealand early childhood sector, that is narrative based) from each teacher before the viewing of the immersive video and compared them to another corresponding group of learning stories after the viewing of immersive video and once all the interviews were completed. Comparing the assessment information is important for this thesis as learning stories reveal the meanings granted to play as learning through the eyes of the teachers (White et al., 2020) and potentially the shifting frame of how play is viewed by the teachers.

The learning stories were screened for the degree to which play themes featured in them, particularly if the focus of the learning story is on set goals or play as a self-actualising tool for learning and development.

5.4. Analysis Processes and Procedures

Employing the notion of ‘conceptual processing’ (5.1. as a route to seeing play, I set out to understand how immersive experiences with virtual reality might enable teachers to “see” children's play as an immersive pedagogy in action in order to develop alternative insights about the phenomenon.

Guiding interview questions were developed in line with the structure of this framework to enable a seamless analysis of data. The use of guiding interviews is sanctioned by the already explained notion of phenomenology that is concerned with comprehending the world as it is, according to subjective experiences of individuals

(Schwandt, 1998). The scope of data that were generated from analysing the empirical teacher engagement with this study endeavoured to address the following questions:

i.) What were the initial attitudes, understandings, wonderings and knowledge of teachers concerning certain aspects of play?

ii.) What emotional responses of teachers, if any, were observed during their engagement with the VR technology?

iii.) What new/alternative attitudes, insights, understandings, wonderings and knowledge did teachers develop as a result of the engagement with the representations of play experiences in VR?

iv.) How effective and in what way was VR technology in developing new insights into play?

The answers to these questions allowed the researcher to analyse the new subjective insights. Aspects of play that were investigated empirically were based on ideas investigated in the theoretical chapter concerning play and included:

- Free Play
- Teachers' role in play
- Space and time to play
- Play in the curriculum
- Stakeholders affecting play

These theoretical conceptions of play were the focus of probing interview questions asked before the viewing to address question i.) and after the viewing to address question iii.). The interview videos recorded for analysis co-created multiple realities and insights that were epistemologically interpreted to discover the underlying meaning of play for the individuals (O'Toole & Beckett, 2010).

The embodiment theory 4.4. outlines the connectedness between the world-senses-body-mind, saying that any significant experiences perceived will result in an

embodied reaction. The emotional responses observed were investigated by employing the lens of conceptual processing and included these observable embodied actions:

- Movements of the head
- Movements of the body
- Smiles
- Gasps
- Teachers facing the same direction

This part of the empirical research was strongly contingent on the embodiment theory and more specifically on the close link between the sensorial and motoric neural pathways which enabled the researcher to observe and explain the responses of the individuals. Throughout this analysis the body is seen as a bipolar construct built from physical and lived experiential structures, "outer" and "inner", biological (scientific) and phenomenological (Varela et al., 1991). The analysis emerged from phenomenology and was a reflective and subtle one that worked back towards the invulnerable subjectivity of the "inner man" (Merleau-Ponty & Landes, 2012). To address question ii.) the observations of the engagement with the immersive video technology were video recorded. I hoped that through video recordings of teachers engaging with VR, these variations would be observable if they manifested physically.

The application used to analyse the video data was V-Note. The application can analyse timeline-based data in various ways: it can calculate player performance data, inter-rater reliability and percent overlap time between users or categories; it allows to create and manage multiple timelines to label and organise video segments. Using the automatic movie builder enables the user to order and export labelled segments as a new video, which can then be exported. It has been utilised by leading researchers in the field of visual pedagogies using video data, such as Jayne E. White (2016c).

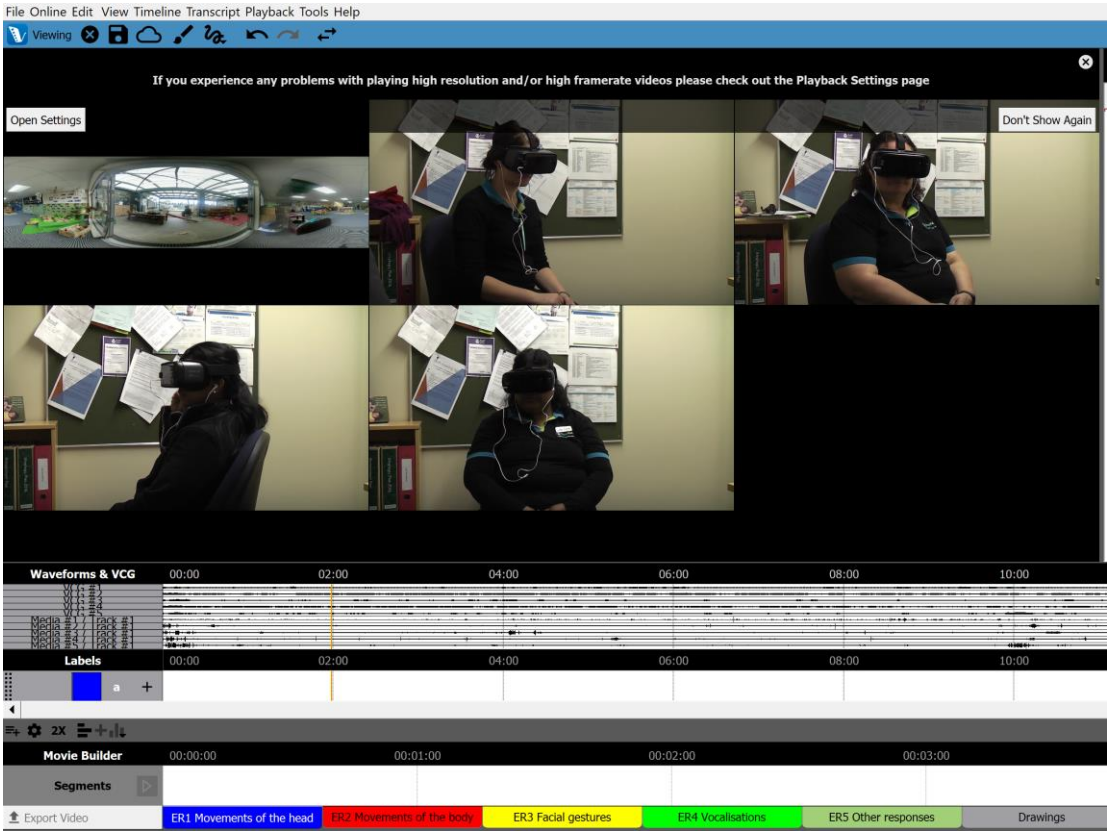


Figure 5: V-note analysis

The "Teachers facing the same direction" analysis tag was added during the analysis stage when I noticed repeated occurrences of teachers looking at the same point in the VR space and found it significant enough to add.

Specific interview questions that were asked after the viewing addressed question iv.) and drew from the embodiment theory and the findings about VR technology focused on:

- VR causing changes in attitudes
- "Seeing" play in VR
- Emotional Responses in VR
- Immersion (Feeling of presence)

- Affordances of VR
- Limitations of VR

These questions relied on the concept described as phenomenological reduction (Husserl, 1999), which is intrinsically related to the phases of conceptual processing. The interview was also directed towards social interpretants, where the experiences of the self (adult) constructively met the experiences of others (researcher and children) to create a sense of the world.

The videos generated from the interviews and observations were coded with the V-note video analysing tool which epistemologically allowed for the knowledge to be "constructed" as it is dependent on conventions, human perceptions and social experiences (O'Toole & Beckett, 2010). In line with this methodological tradition, direct description of the experience as being experienced (in the second lot of interviews) can be endorsed without a need to satisfy scientific considerations (Merleau-Ponty & Landes, 2012). The video analysis proceeded in three steps:

a. Individual video recordings of teacher interviews performed before the viewing of the VR content (4 all together) were sequentially pasted together into one video. This video was then coded with the following tags:
    - IA1 Free Play
    - IA2 Teachers' role in play
    - IA3 Space and time to play
    - IA4 Play in the curriculum
    - IA5 Stakeholders affecting play

    Tagging enabled the researcher to establish the frequency, length (amount), distribution and particular insights uttered for each of the pre-established conceptions of play. Once processed, these data were available for cross-

referencing with the data generated from the interviews recorded after the viewing of the immersive video.

b. The immersive video viewed by the teachers was placed alongside the four observation videos portraying teachers watching the immersive video and all synched to the same timeline. This meant that all five videos were able to be played simultaneously in the analysing tool (V-note), making it easier to observe correlations between teachers' emotional and physical responses as they watched the immersive video. The following tags were applied for this section:
    - ER1 Movements of the head
    - ER2 Movements of the body
    - ER3 Facial Gestures
    - ER4 Vocalisations
    - ER5 Facing the same direction

c. As with part a. the four videos of post-viewing interviews were combined and analysed against the conceptions of play tags that made it easier to identify discrepancies in the frequency, length (amount), distribution of particular instances uttered between the pre-viewing and the post-viewing interviews,hence enabling the identification of the emergence of any new insights and/or attitudes towards play. Additionally, coding tags about the use of VR technology were also included in this part of the analysis process, in summary resulting in these tags:
    - NA1 Free Play
    - NA2 Teachers' role in play
    - NA3 Space and time to play
    - NA4 Play in the curriculum

- NA5 Stakeholders affecting play
- VA1 VR causing changes in attitudes
- VA2 “Seeing” play in VR
- VA3 Emotional Responses in VR
- VA4 Immersion (Feeling of presence)
- VA5 Affordances of VR
- VA6 Limitations of VR

These tags enabled the researcher to generate qualitative research data in the form of social inquiry that focused on the way people interpret and make sense of their experiences and the world in which they live and create meaning from their experiences interpreted with their consciousness. Therefore, axiologically this interpretivist data is value laden and biased (Petty et al., 2012).

5.4.1. **Data Sets**

The quantitative and qualitative data represented and discussed below consists of several data sets:

i.) One shows the percentual comparison between before and after the viewing of VR for the combined amount of time teachers were talking about a certain topic involving play (described by a label for analysis) in relation to the total time of each of the two interview videos.

ii.) The second data set does the same but for the frequency of how often a category came up in conversation throughout each of the two interview videos.

iii.) Teachers were encouraged to free talk, while guiding questions were asked when they stopped in their self-initiated verbalisations. When teachers free-talk they discuss aspects of play that are in the forefront for them and consequently their utterances were be less focused on one specific topic

(labels) at a given time. When teachers stopped conversing, guiding questions oriented them towards specific labelled characteristics of play. The third data set outlines dispersion or grouping of individual utterances regarding a specific labelled characteristic that may indicate what was in the forefront for the teachers at the time of the interview and the importance teachers placed on a certain aspect of play. This data set is represented in the form of histograms, each of which illustrates a specific label for either before or after the VR viewing. This enables comparisons to be made between them to illustrate a quantitative shift in focus between the first and the second interview.

iv.) The final two data sets were gathered while the teachers were interacting with the immersive video, one of them portraying their motor responses;

v.) and the other the number of teachers that were in the immersive video who jointly oriented their bodies towards a certain place of focus in the virtual environment. This enabled the researcher to establish how prominent certain experiences of play in the virtual environment were for them.

vi.) The qualitative data summarise factual and contextual information that the teachers found important to talk about in relation to each of the chosen categories, and outlined their initial attitudes, habits and perception in relation to play before and after the viewing. Each of the two videos has been coded to labels to which the analysing software generated new video snippets that only included parts of the interviews coded to a specific label. This enables the researcher to more effectively establish what was said about a certain topic (label) and also to compare qualitative data regarding the same topics in form of the utterances of teachers before and after the viewing of the immersive videos.

vii.) Similarly, as above, qualitative data have also been gathered regarding the experience with the immersive video and the VR technology mediating it, with appropriate specific labels and correspondingly reduced video snippets.

viii.) A qualitative comparison between learning stories from before and after the viewing of the immersive video was developed to account for any changes teachers might have made to the way they assess children in the play-based curriculum.

5.5. Ethics

5.5.1. Access to Participants

Permission to approach staff and families in the centre was gained from the centre management first. Requests for written consent were distributed to the leadership, parents and teachers of the selected ECE centre. Consent for children was sought by proxy from their parents/family (Appendix 3 and 4).

The systems and procedures of the centres considered for the research are well known to the lead researcher and it is the culture of these centres that they invite research to be done there. This meant no further approaches need to be made until ethical approval has been given by the University of Waikato's Ethics committee (Appendix 3).

5.5.2. Informed Consent

Introductory letters and consent forms (Appendix 4) provide details of consent processes for all parties. Informed written consent was gained from all participants. In particular, participants were informed of the fact that the nature of the 360-degree video data involved meant that neither anonymity or confidentiality could be assured in any publication or presentation arising from the study. Additionally, children who indicated discomfort with any aspect of the process would not be further involved in the study, and recording would cease on that day. This was carefully monitored by the researcher in consultation with both the teachers and parents throughout field work. In the case of any participants withdrawing, all video and

interview data identifying them would have had been immediately eliminated from the study prior to analysis.

5.5.3. Anonymity/ Confidentiality

As explained above, due to the visual nature of data generated, neither anonymity nor confidentiality could be guaranteed in this study. Participants were given the opportunity to nominate a pseudonym for themselves or their child. Permission to name the centre and its identifying features was sought as having these anonymised was impossible. Observational data allowed for anonymity by the use of codes.

5.5.4. Potential Harm to Participants

There could have been potential power issues if the centre had reported directly to the lead researcher who works as a professional services manager for the organisation. This was averted by none of the centres directly reporting to the lead researcher being considered for the study. As the lead researcher is in a managerial position, even while the centre was not directly reporting to the researcher a minimalised power issue persisted. This was be further diminished by the voluntary participation to the study being anonymous and self-selecting; therefore if any centre would have had not wanted to participate in the study, its staff would have been able to state this anonymously, and the centre would not have been considered for the research. In such cases it would have been possible to select another centre.

Similar power issues could have existed for families who were invited to participate. This issue was ameliorated by the fact that families (and teachers) were approached by ECE service leader rather than the lead researcher.

In the event of a teacher disclosing personal details concerning the focus child's development during the course of an interview that have not been discussed with the family, the researcher would have had invited the teacher to share this information with

the family prior to analysis of results. If this was not possible the information would have been eliminated from the data set.

6. Findings

6.1. Summary

The researcher's metaphysical laboratory was positioned in the virtual space and accessed through VR. It became a pivotal tool in re-framing play, as it offered insights into players' subjective experiences when engaged in play. Teachers were empirical participants in play: they became observers of play, able to engage with play subjectively without the need for it to be studied extensively as an object. This enabled them to *Deframe* play.

Immersive videos are a form of VR that has the potential to be a platform to achieve this by rendering the play frame permeable to enable comparisons to be drawn between what is occurring in and outside of the virtual play experience, allowing for insights into how adult presence or absence affects the nature of play (Marjanovic-Shane & White, 2014). These aspects of play were examined in the empirical part of the study, in which qualified ECE teachers were placed in the VR environment to become immersed within pre-recorded play episodes to discover what more they could 'see' in children's play through the cybernetic looking glass. These discoveries enabled observers to become participants in play, without being the protagonist in the play scenario. They remained observers while being able to become part of the play frame. Holst (2017) has remarked that this is a process that involves "one of the walls in play [being] let down and spectators become part of the play's flow" (p. 93) and that is when the illusion lifts and the features of play are revealed. The teacher subjects confirmed this occurred for them. Though being immersed in the representations of play experiences, teachers attained a state of being where, because of their heightened emotional investment in play, they were able to become part of the dynamics of play. This state of *poiesis* enabled them to overcome their initial framed attitudes towards play. As the "invisible observer", as they referred to themselves in these

phenomenological encounters, they were able to develop a number of important insights.

6.2. Results

The sub-section below outlines the quantitative and qualitative results of the study, in order for the reader to be able to see in what ways the data has been analysed and discussed after. Furthermore, if other researchers would like to use this data in their future research it will be most useful in its raw form.

The data will be made sense of in the sub-section that follows this one, which will interpret it through the lens of the analytical framework.

6.2.1. Interview Data Before and After Viewing of VR Content About Play

Label Name:	Instances:		Total time:	
	Before VR	After VR	Before VR	After VR
IA1 Free Play	36	24	05:54	04:53
IA2 Teachers role in play	36	46	05:40	09:20
IA3 Space and time to play	55	26	12:26	05:31
IA4 Play in the curriculum	40	13	08:12	02:26
IA5 Stakeholders affecting play	43	11	12:10	03:55
Sum	210	120	44:22	26:05

Table 2: Quantitative Results for Interviews Held Before and After the Viewing of VR Content (Showing Number of Instances and Total Talking Time of the Video Corresponding to the Individual Play Category Labels).

Label Name:	Instances (%):		Total time (%):	
	Before VR	After VR	Before VR	After VR
IA1 Free Play	17.14	20	13.31	18.73
IA2 Teachers role in play	17.14	38.33	12.77	35.80
IA3 Space and time to play	26.19	21.67	28.03	21.16
IA4 Play in the curriculum	19.05	10.83	18.47	9.31
IA5 Stakeholders affecting play	20.48	9.17	27.43	15.00
Sum	100	100	100	100

Table 3: Quantitative Results for Interviews Held Before and After the Viewing of VR Content (Showing Percentages of Instances and Total Talking Time of the Video Corresponding to the Individual Play Category Labels).

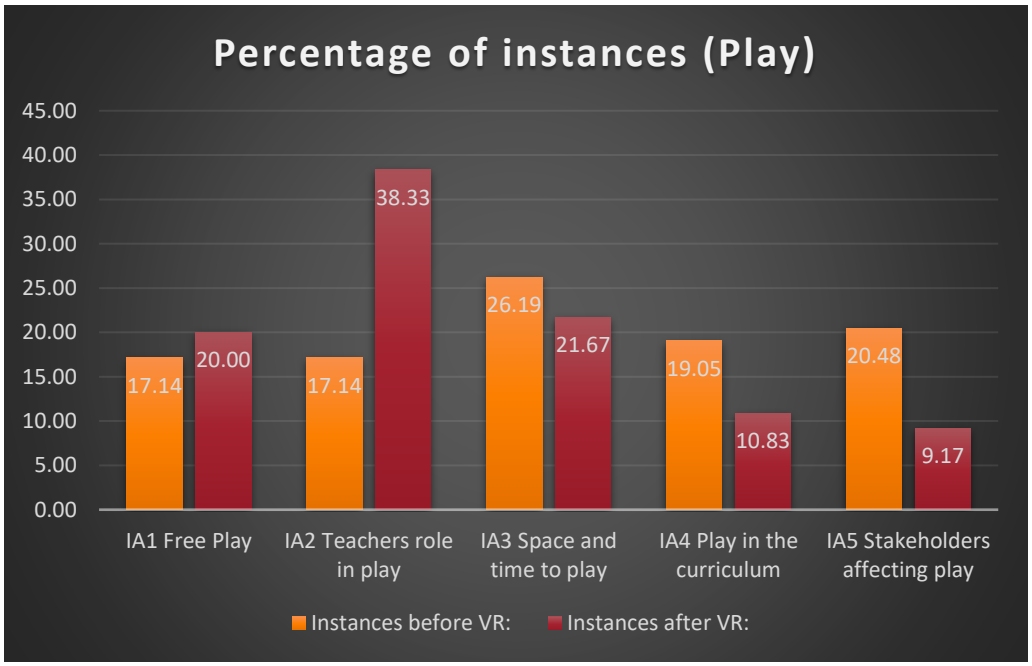


Figure 3: Comparison Between the Percentages of Instances When Teachers are Talking About Certain Categorised Play Topics at Interviews Held Before and After the Viewing of VR Content.

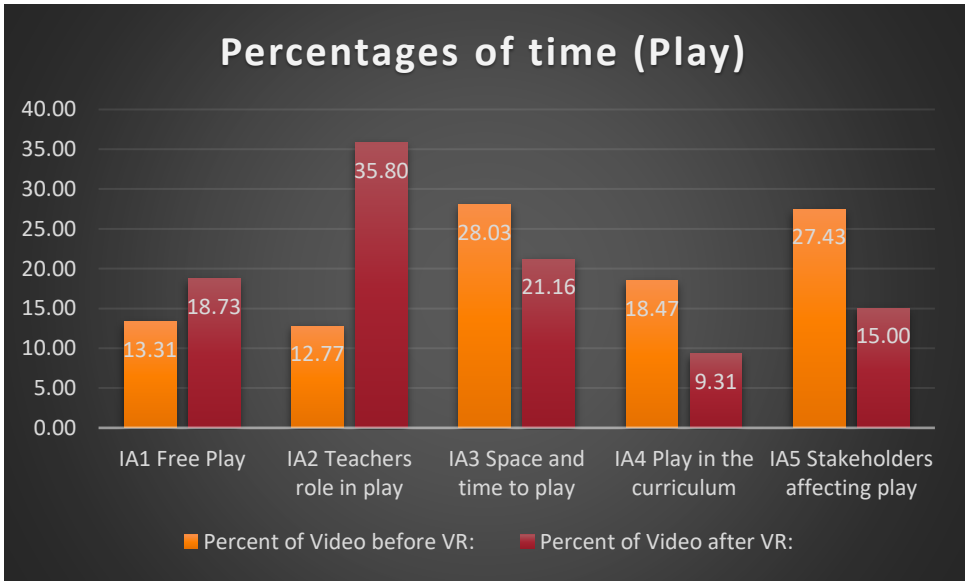


Figure 4: Comparison Between the Percentages of Video Teachers Talking About Certain Categorised Play Topics at Interviews Held Before the Viewing of VR Content.

6.2.2. Interview Data After Viewing of Immersive Video about the VR

Label Name:	Instances (%):	Time (%):
VA1 VR causing changes in attitudes	29.25	30.55
VA2 'Seeing' play in VR	17.01	15.59
VA3 Emotional Responses in VR	9.52	8.55
VA4 Immersion (Feeling of presence)	12.93	11.49
VA5 Affordances of VR	24.49	27.70
VA6 Limitations of VR	6.80	6.13
Sum	100	100

Table 4: Quantitative Results for Interviews Held After the Viewing of VR Content (Showing Percentages of Instances and Total Talking Time of the Video Corresponding to the Individual VR Category Labels).

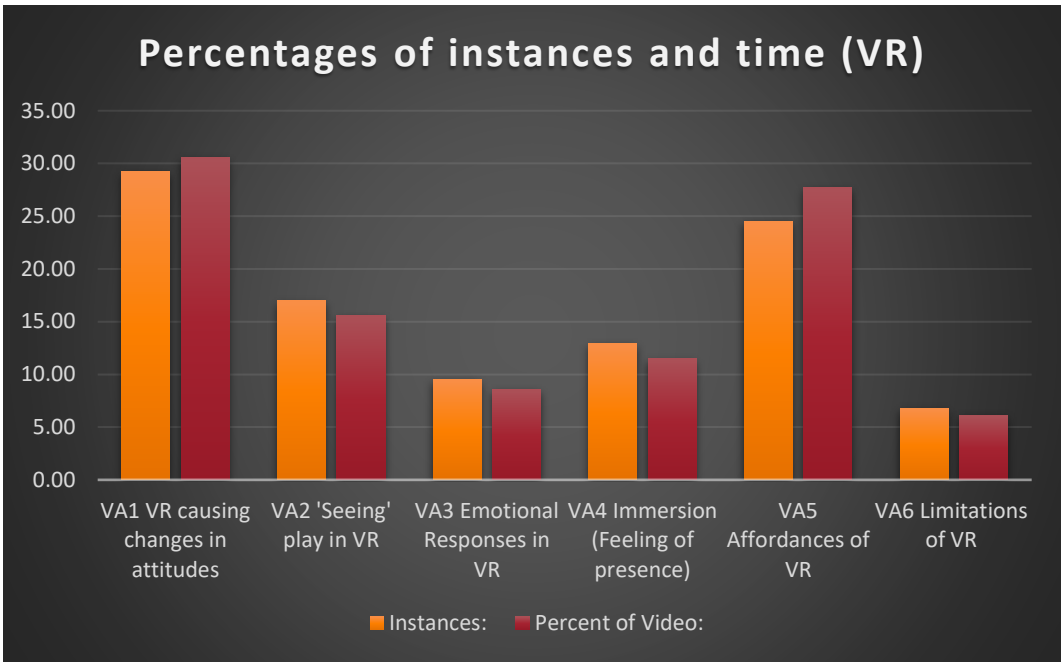


Figure 5: Percentages of Instances and Time of Full Video with Teachers Talking About Certain Categorised VR Topics at Interviews Held After the Viewing of the Immersive Video.

6.2.3. Data from Video Observation of Teachers Viewing Content in VR

Label Name	ER1 Movements of the head	One Teacher	Two Teachers	Three teachers	Four teachers
Instances	178	75	56	35	12
Total time	10:52	04:48	03:22	01:56	00:46
Percent of video	63.67%	28.11%	19.71%	11.33%	4.52%

Table 5: Quantitative Results for Motor Responses in Movements of the Head During the Viewing of VR Content (Showing Number of Instances, Total

Talking Time and the Percentage of the Video in Total, for One and for Two to Four Teachers Moving Simultaneously).

Label Name	ER2 Movements of the body	One Teacher	Two Teachers	Three teachers	Four teachers
Instances	145	89	40	15	1
Total time	07:52	05:02	02:12	00:34	00:04
Percent of video	46.12%	29.44%	12.92%	3.35%	0.41%

Table 6: Quantitative Results for Motor Responses in Movements of the Body Excluding the Head During the Viewing of VR Content (Showing Number of Instances, Total Talking Time and the Percentage of the Video in Total, for One and for Two to Four Teachers Moving Simultaneously).

ER3 - Facial gestures, ER4 - Vocalisations and ER5 - Other Responses were all nil and were dismissed from the data set.

Label Name	ER6 Facing the same direction	
	Three teachers	Four teachers
Instances	53	28
Total time	05:36	04:46
Percent of video	32.72%	27.87%

Table 7: Quantitative Results for Motor Responses in Three to Four Teachers Facing the Same Direction During the Viewing of VR Content (Showing Number of Instances, Total Talking Time and the Percentage of the Video in Total).

6.2.4. Facts Taken From Learning Stories Before and After the Viewing of the Immersive Videos

A set of seven randomly selected learning stories written before the viewing of the immersive videos by teachers involved in this study was analysed for features important to this thesis. Another set of seven learning stories written after the teachers watched the immersive videos was chosen and analysed in the same way. The characteristics chosen can be seen in the table alongside the number of stories out of seven in which these features were represented.

Feature of Learning Story	Before	After
Talking about the qualities and abilities of the child	7	7
Engagement in formal learning activities is celebrated	7	5
A curriculum goal with a next step is identified	7	7
No mention of Play in Learning Story	6	2
Play mentioned, but used to achieve a curriculum goal	1	5
Play celebrated as self-actualising tool	0	5
Techers mentioning observing children at play	0	7
Summary of play being mentioned throughout all 7 learning stories	1	14

Table 8: The Frequency of Chosen Features Identified in 7 Learning Stories From Before the Viewing of the Immersive Video and After.

6.3. Making Sense of the Data

This section will make sense of the data presented above. The significance of the data for this thesis is examined in the following two section. I have decided to proceed in

this manner to effectively demonstrate the process of data organisation, analysis, and interpretation. The data are firstly made sense of according to individually assigned label categories before they are collectively interpreted and discussed based on the analytical framework. In each category the quantitative data is analysed first and then used to help interpret the qualitative data. Hence qualitative and quantitative data together support the findings for this thesis.

6.3.1. Free Play

Teachers talked about free play close to 3% (Figure 3) more often after they had engaged with the immersive video than before. Whilst this increase is slight it does signify a shift in thinking, and this is further supported by the fact that teachers talked about play for close to 5.5% (Figure 4) longer after the viewing.

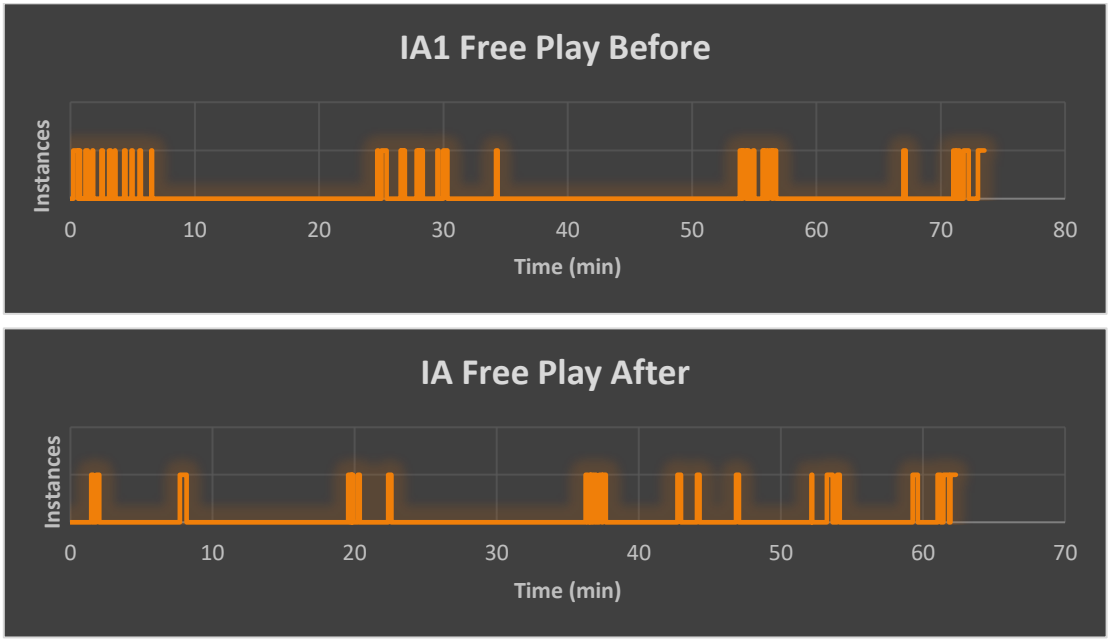


Figure 6: Dispersal and Grouping of Instances of Teachers Talking About Free Play Through Time.

The histograms displayed in Figure 6 show that Free Play has been talked about more evenly throughout the interview after the viewing than before it, demonstrating increased teacher initiative and openness to talk about this topic. In the first interview the responses were a lot more clustered, highlighting a greater need for support from the researcher to guide teachers with questions.

https://youtu.be/4lh4aphaIuE

Video 1: Individual Video Recording of Teacher Interviews Performed Before the Viewing of the VR Content Referring to the label IA1 - Free Play.

Qualitative data shows a strong focus for teachers in the initial interviews on the importance of play for learning, stating that ECE is all about free play through which children learn. Statements confirming this focus included references to: free play supporting children's responsibility for their own lifelong learning in their own time

and pace, extending their knowledge, developing their thinking, literacy, numeracy, language and communication skills, a willingness to learn and enabling teachers to get to know their learners better in order to help them learn more.

As I made sense of Video 1, I got an overall sense from most of the teachers that they had some difficulty explaining free play without relating it to learning. One teacher brought notes with her to be able to articulate her ideas better. When the teachers were asked for a deeper understanding of the nature of free play, several additional guiding questions were required to arrive at responses that related to the themes the researcher was looking for; hence, the flow of the interviews was at times disrupted. This is further supported by the quantitative data found in the histogram above (Figure 6).

While curriculum-prescribed learning was at the forefront for teachers as they talked about free play before the viewing, several other functions of play were recognised, mostly in relation to affective and social development. They noted that through free play children are able to work through problems and resolve emotions, while being able to express themselves, develop imagination and creativity, and add complexity to their own creations. It was also stated that children develop curiosity while exploring and experimenting and getting to know themselves and their bodies; they are also able to express freedom and choice. In a social context, children engaged in free play are according to the teachers developing their social competency and self-regulation while making friends that support them to share, turn-take, listen to their ideas and contribute knowledge from home. They can be themselves, have fun and choose whether they want to play alone or in a group.

A teacher talked about how she recognises and values free play and its benefits in New Zealand now, but she did not before, due to how play and learning are seen in her home country. Another teacher noted that teachers have challenges in providing free play experiences due to routines and other aspects of centre operation.

https://youtu.be/dM-KRUCo_DQ

Video 2: Individual Video Recording of Teacher Interviews Performed After the Viewing of the VR Content Referring to the Label NA1 - Free Play

The video montage of interviews regarding free play that took place after the teachers viewed the immersive video (Video 6) indicated a move away from free play as a tool for learning to a much stronger focus on free play as a self-actualising tool. This was evident throughout several themes that emerged. It is very interesting to note that most themes were talked about by several, though not all, the teachers, suggesting that they were able to recognise ("see"), free play in very similar ways. The themes extended to observations of what happened with free play when teachers are not there, when the teachers introduce their own narratives to play, when children are involved in pretend play, when teachers encourage or join in play and what challenged their thinking and generated new realisations about free play for them.

Teachers found it interesting to see how children are playing and what they are doing when the teacher is not there. They noticed that the children are more disciplined when the teachers are watching and that when children are not being constantly watched a number of interesting interactions emerge that teachers would have not seen otherwise. A teacher posed the example of a child who, when no one was watching, was throwing toys over the fence as part of his play, but when the teacher appeared the play was instantly halted.

The teachers also noted that free play is disturbed even more when teachers try to take over children's play. They suggested in some examples that free play shifted from what the child wants to use resources for, to what the teacher wanted it to be used for and that resulted in children losing their enthusiasm and interests for their play. When teachers made it their own play, or tried to extend play, children's ideas were taken away from them and consequently their imagination and free play stopped, and the

children moved somewhere else. Play was seen as more meaningful when the children played on their own and most interviewed teachers highlighted this with the example of a child playing with a box. They were deeply surprised about the number of uses the child found for the box and a teacher noted that this reminded her of her studies and even more so of her own childhood. Teachers could feel the child's excitement and see the strong interest the child was having in the box, while enjoying his own play. They recognised that this was occurring because the teacher was not adding her own ideas, but instead encouraged his play to flourish by expressing how much she valued it, which in turn made the child come back to the teacher seeking further interactions on several occasions. The teacher in question noted pride in herself, as she was able to interact and teach the child from "inside the play" as an invited participant and actor.

Teachers found that the experience with the immersive video made them think about their practice and what they would do if the situation they were presented with would happen again; for example, when the children were engaged with what they wanted to in their play a teacher was contemplating how she would balance free play and her teaching intentions. Teachers also became more aware of what they were saying and doing in their interactions with children. They realised that play is best uninterrupted and that children need to be given choices in their play. A teacher shared that teachers are at times conflicted about what the correct choices are in relation to their practice regarding play and suggested that they should endeavour to see play through the children's eyes to understand their teaching practice better. The teacher specifically noted that, based on what she has seen in the immersive video, she now believes that children should be given more space for free play without teachers constantly hovering or taking their play over with their own teaching narratives. Teachers still believe that supervision is important, but felt that did not mean that they should be taking control of play, but rather they should enable the children to make their play more complex on their own.

6.3.2. Teacher's Role in Play

Teachers were considering their role in play substantially more in the second interview than in the first, with a rise from 17.14% to 38.33% and for a longer time with an increase from 12.77% to 35.8%. Thus the percentages have more than doubled, the strongest shift recorded for any of the qualitative data sets. This increase signifies a much stronger focus of the interviewed teachers on the role of teachers as practitioners in an educational setting regarding play, including their own personal responsibility in this space.

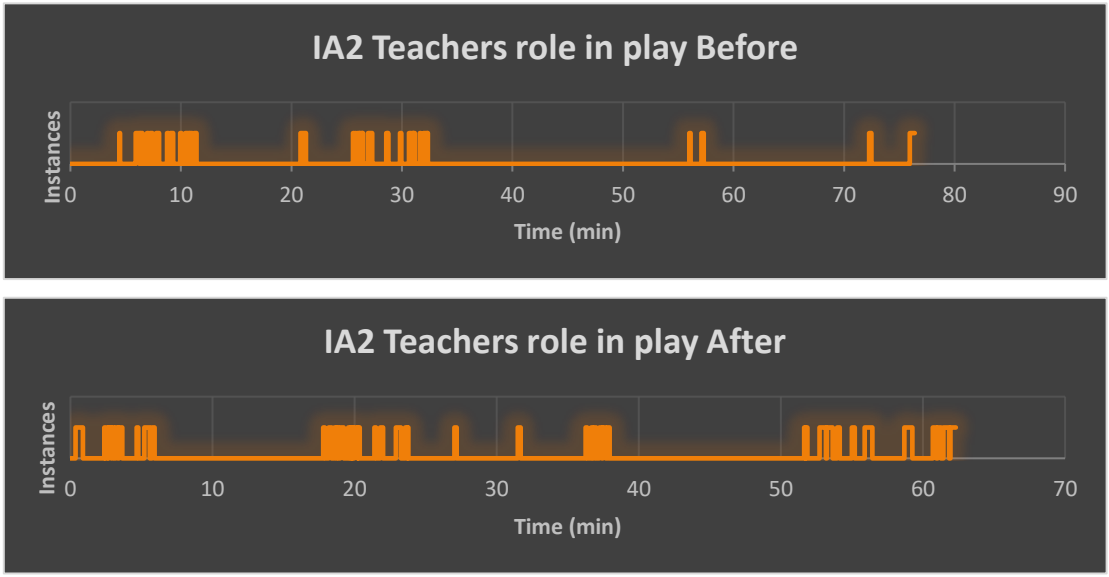


Figure 7: Dispersal and Grouping of Instances of Teachers Talking About Teacher's Role in Play Through Time

The histogram (Figure 7) illustrates a greater dispersal of instances of the teacher's role in play being discussed in the second interview in relation to the first one. While initially most of the utterances occurred in the first half of the interview in accordance with the interview guiding questions, in the second interview the discussions about the teacher's role in play persisted strongly in the second half of the interview as well. This

implies that the teachers now felt an urge to talk about the topic, as suggested in the craving stage of conceptual processing, where the individual is dissatisfied with the disequilibrium in their cognition and is using reasoning to make sense of it and re-establish the balance by allowing new insights to settle in their minds. These insights are going to be examined next by considering the qualitative data.

https://youtu.be/J8OHZwO48fI

Video 3: Individual Video Recording of Teacher Interviews Performed Before the Viewing of the VR Content Referring to the Label IA2 – Teacher's Role in Play.

In the first interview teachers explained that their role in regard to play is to provide opportunities for children to engage in play, for group interactions, facilitate learning, encourage, role model and support children verbally and to make the environment, equipment and resources available to them. Further, they stated that the focus of the teachers should be to help the children to become socially competent, confident in who they are, able to develop relationships and develop basic literacy and life skills, that are going to be absorbed through play.

A teacher noted that knowing when to intervene verbally during play is important for teachers; however, there was no consensus between teachers on this matter. Some suggested that teachers should provide many open-ended questions and a range of additional ideas, while others added that children will generally take these ideas in a completely different direction if they apply them. A teacher noted that initially she would have seen this as a "fail" but now expects it to happen. Another teacher added that it is the role of the teacher to provide additional ideas for children's play, but to also respect their decision if they do not want to implement them and that children should be given time to think and allowed to engage with the learning environment in their own way. A teacher also noted that sometimes teachers think that they understand

how play functions for children, but they still cannot leave children to themselves when the situation calls for it. One teacher noted that if children are deeply engrossed in play, she would not join in without asking if she could do so, or if she was invited in as a play-mate. It was suggested by a teacher that using too many instructions and commands should be avoided, to enable children to learn on their own. A teacher felt that intentional teaching is important, but a focus on creativity should also to be considered.

Some teachers were favourable towards rough-and-tumble play, but unsure about gun play and aware that at some places it is allowed while at others it is not. A teacher said that most children only see war play as playing, but that some do not and take it very seriously. She felt torn between the immense creativity of the children displayed when involved in war play and the inappropriateness of the themes being played out. At this centre children are not allowed to play with guns.

https://youtu.be/nP_N8ZDDnGI

Video 4: Individual Video Recording of Teacher Interviews Performed After the Viewing of the VR Content Referring to the Label NA2 – Teacher's Role in Play.

A strong theme that emerged in this section revolved around teachers' understanding of when and when not to intervene when children are playing. In the first video there were some striking differences in teachers' thinking around this issue: some noted that teacher intervention is often necessary, while others had a more liberal view on when teachers should intervene. After the viewing this polarity seemed to have turned into comprehension. One teacher commented on the number of questions teachers ask while children are engaged in play and stated that she had not realised this before, and that it is not something she thinks about. She wondered why the teachers were consistently trying to prompt the children to talk to them, in some cases apparently inconsiderate of

what they were doing. She then recalled a section from the immersive video and mentioned a situation where the questioning was done very well, as the teacher related it to the play of the child and was teaching him from within play.

Another teacher specifically noted that the experience with the immersive video helped her to better see when and when not to intervene in play, by helping her understand the importance of making sure that teachers are not running the play but instead let the children guide them. It was also stated that teachers should not take children's play over and make it their own. A teacher found it interesting to see how one teacher helped a child with their creation without taking the play over. Another interviewee commented on the ability of the same teacher to stand back while still providing verbal encouragement. Examples were noted, of when children's narratives of play were taken away from them by teachers, resulting in diminished creativity and enthusiasm for play, and ultimately in play stopping. It was noted by a teacher that this was good for her to see, to be more aware of what she was saying and doing. Sometimes she felt like jumping in and helping children right away but now realised that this was not actually helping them. When teachers express genuine interest and show that they value children's play it enriches and reinforces play and enhances their creativity.

A teacher enjoyed seeing her own interactions with the children, when she was going with the flow of a child's play while questioning him, teaching him within the play and supporting his creativity. She also reflected on the fact that she needed to stop tidying up and resetting the room so often and instead focus more on the play of the children; she felt too, that children should be given more space to play. The teacher found it interesting to be able to compare how free play was offered when the video was taken in comparison to now and could see that the play interactions have not changed.

6.3.3. Space and Time to Play

Teachers spoke about space and time to play less often (from 26.19% to 21.67%) and for a shorter time (from 28.03% to 21.16%) in the second interview than in the first. This shows that the focus of the teachers has marginally shifted away from this topic. This can be accounted to their attention moving more towards free play and teacher's role in free play, but it also suggests that space and time to play were still important to them.

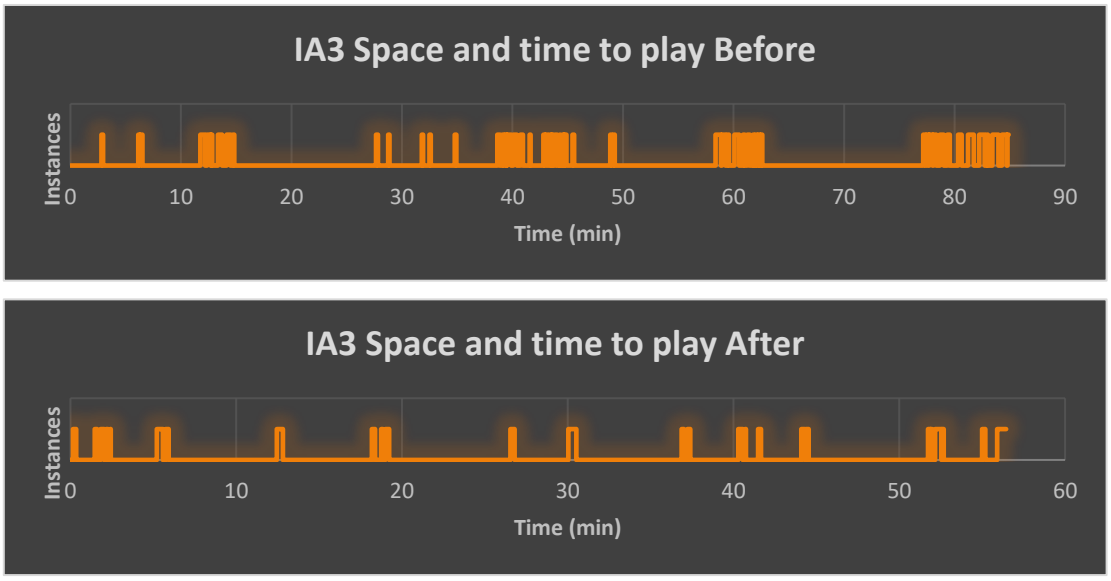


Figure 8: Dispersal and Grouping of Instances of Teachers Talking About Space and Time to Play Through Time

The topic manifested itself for teachers a lot more evenly and spontaneously through the conversations in the second interview, rather than when it was talked about in a structured, more time bound way in relation to the prompting questions in the first interviews as seen in Figure 8.

https://youtu.be/TCwvmaL1EPE

Video 5: Individual Video Recording of Teacher Interviews Performed Before the Viewing of the VR Content Referring to the Label IA3 - Space and Time to Play.

Teachers found that making resources available to children was very important for enabling play, but also noted that these resources can be simple and open-ended. It was deemed important for teachers not to get too attached to their own plans and resources, but to follow the child's initiatives and interests to form the environment and resources based on the children's initiatives in play, as children learn a lot from the resources they are engaging with.

It was acknowledged that children like to hide from the adult gaze when they are playing; hence, unobtrusive supervision without hovering around for too long is key to giving children space to play. On reflection, a teacher talked fondly about a relative who is allowing her daughter to play whenever she desires. Some teachers argued that much of what children do is not seen by teachers, for example, they sometimes construct extraordinary creations where the teacher has missed part or all of the process. This was countered by other teacher saying that their positioning as per their centre supervision plan ensures that all children are always seen by someone. This highlights an important tension identified by the teachers - between the willingness to give children space and time to play and the expectation of constant supervision set by centre policies. This may be indicative of the theorised notion that early years centres are expected to be calm and orderly places of learning, where festive play is being discouraged.

Pertinent to this conflict of views, and at a deeper level, are the observations of some teachers in the first interview that R&T play is important and that teachers should be promoting it as another facet of free play, and teach the children how to play safely. In

contradiction, other teachers stated that play such as R&T play needs to be strongly supervised and limited to prevent injuries of occurring including minor scratches, so as not to upset the parents. It was noted by some that such views are reducing important opportunities for risk-taking, and they cited the disappearance of trees in playgrounds as an example. Gun play is not allowed at their centre, but teachers were aware that some other centres allow it while regulating it with strict rules. Diverse opinions surfaced between teachers when asking whether children see gun play as play: some agreed and others noted that not all children see it as play as it depends on their state of mind and age. A couple of comments were made about a perceived strong influence of TV on children's war play at the centre.

Teachers felt that there is a good balance between child-guided and adult-guided experiences at their centre and that in most cases children's initiatives prevail over the adult ones. Some teachers said that they prefer child-guided and believe that children learn best this way. There was a consensus between the teachers that in relation to play they review play areas, but not specifically play itself.

https://youtu.be/DjSjQy_Vwbw

Video 6: Individual Video Recording of Teacher Interviews Performed After the Viewing of the VR Content Referring to the Label NA3 - Space and Time Play.

While teachers stated before watching the immersive video that they were giving a lot of space to their children, they realised from seeing it that this was not the case, and specifically commented on being surprised by what they saw.

They saw that in some cases they were adding their own ideas to the play of the children, and noted that this might be due to some concerns about children's safety. They agreed that by presenting them with clear examples the immersive video enabled teachers to better see when to give children more space and when it is necessary to intervene. All

teachers agreed that they did not like the way child's play was affected when in some examples the choices for children were limited by adults, as their engagement and imagination in play declined.

Observing the environment in the immersive video caused several reflective statements to surface in the second interviews. These observations revolved around comparisons between what the physical environment looked like when the video was taken and how it was at the time of the interviews. Teachers found the comparisons interesting and have been drawing some reflective conclusions, such as realising that the change in the environment was fuelled by the shift in their teaching philosophy towards focusing on creating more open spaces for children. Another reflective statement posed by a teacher voiced that the change in the environment between what it looks now and then is irrelevant as long as the children are interested in it.

6.3.4. Play in the Curriculum

Qualitative data showed that teachers placed great importance on play in the curriculum before the viewing of the immersive video with 19.05% of the instances covering this topic and for 18.47%of the time during the full-length interview video. These values significantly decreased after the viewing of the immersive video to 10.83% of mentions and 9.31% of time spent focused on play in the curriculum, which signifies a close to 50% drop of interest in this topic after the interviews. It was clear from the summative comments made in the interviews that teachers viewed the curriculum as a necessity they needed to intentionally embed into play because of their responsibilities and expectations as teachers and hence they saw it as a factor external to play. It can be assumed that they spoke a lot about the topic prior to the viewing due to feeling obliged to do so in line with their professional conduct. In the second interview their focus shifted from this external element of play, to play itself and their roles in being part of that play.

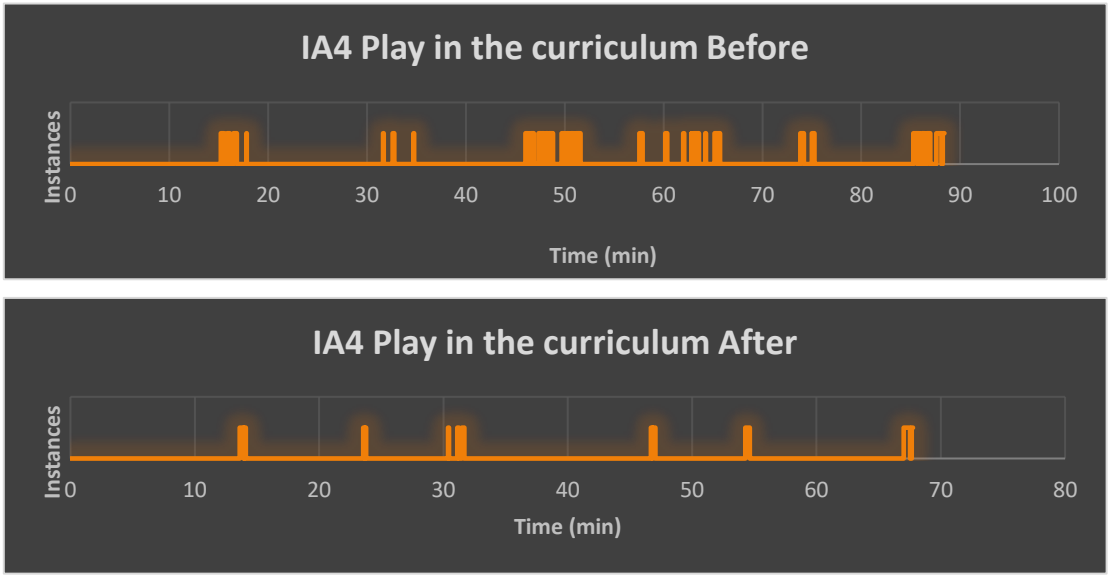


Figure 9: Dispersal and Grouping of Instances of Teachers Talking About Play in the Curriculum Through Time

Instances of teachers speaking about play in the curriculum were relatively evenly clustered after the viewing of immersive videos, while before the viewing numerous instances were grouped together, which could be again explained by teacher's still making occasional references to the topic, but generally moving their focus to factors more internal to play, such as free play and the role of the teacher in play.

https://youtu.be/vqeKotbAS7s

Video 7: Individual Video Recording of Teacher Interviews Performed Before the Viewing of the VR Content Referring to the Label IA4 - Play in the Curriculum.

An important focus that arose in the interviews was the issue of setting goals for children and the influences of parents and Primary Schools on this process. Teachers noted that aspirations for children are documented through planning and assessment

practices and are being met through play. These aspirations are mostly outcomes set collaboratively by teachers and parents. It was found that most parents are trying to set academic outcomes for their children, while teachers support them through conversations to understand the importance of dispositional learning, to achieve a desirable balance. It was highlighted that dispositional learning needs to have precedence to enable children to learn social and communication skills, while experimenting with their environment. The importance of purposefully setting environments was noted by teachers as an important part of the curriculum.

There were some contrasting views between teachers about setting and achieving children's goals. Some teachers placed more importance on the adult-guided intentional teaching oriented on achieving goals, while others thought that teachers should be more spontaneous and follow the initiatives and interests of the children. One teacher noted that she likes intentional teaching and understood its role in the curriculum, but that she felt that free play is more important.

https://youtu.be/s7ZKPKTH17U

Video 8: Individual Video Recording of Teacher Interviews Performed After the Viewing of the VR Content Referring to the Label NA4 - Play in the Curriculum.

In the interview after the viewing of the immersive video teachers said that they were able to see the curriculum in action and while a teacher could not specifically say what the goal for the child she observed was, she was convinced that the teacher was using intentional teaching to support that child's dispositional goal. Additionally, it was observed how open-ended questions posed by a teacher had supported a child's creativity through play.

The planning wall was being observed by a teacher in the immersive video, where she was interested as to what the focus of it was at the time. She also reflected on the ways

teachers communicated with the children, so she could use their teaching strategies, while another teacher concentrated on trying to understand what one of the educators in the video was thinking while interacting with the children. Another teacher suggested that the teachers might be thinking about how she could support communication and teaching children about boundaries while creating a safe space for everyone. The teacher commented that she: “could clearly see and make sense of what actually she was trying to teach at that time.” It is interesting to note here that two teachers were wondering about a teacher’s thought processes and intentions observed in the immersive video.

6.3.5. Stakeholders Affecting Play

Stakeholders affecting play were a major focus for teachers in the first series of interviews with 20.48% of all instances talking about this topic 27.43% of the time in the interview video. After the viewing of the immersive video the focus on this play topic dropped sharply to 9.17% of instances talked about for 15% of the time. With approximately a 50% decrease it can be suggested, as in the previous section, that the focus has shifted from this topic that was now seen as an external factor of play to areas that are more internal to play, such as free play and teacher’s role in play.

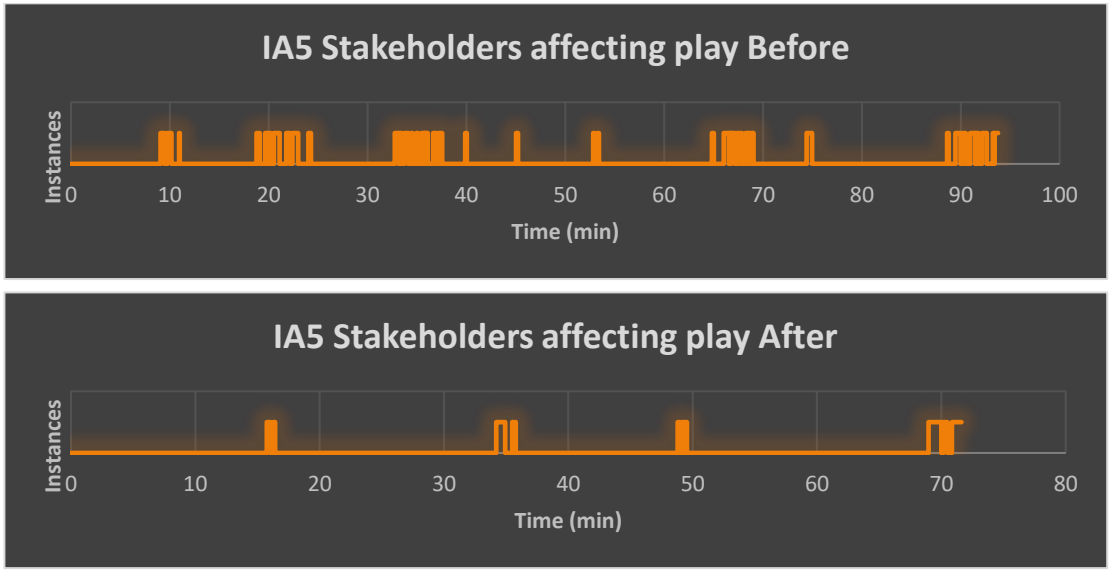


Figure 10: Dispersal and Grouping of Instances of Teachers Talking About Stakeholders Affecting Play Through Time

The above histogram (Figure 10) shows that the stakeholders affecting play topic only came up on four occasions (with several instances uttered) after the viewing of the immersive videos, while in the interviews prior to the viewing it was a lot more prominent and discussed on several occasions throughout the video. This illustrates that the viewing of the immersive video had a profound impact on the teachers' discussion theme about play. Stakeholders affecting play became significantly less important for the teachers to talk about once they had engaged with the representation of play itself.

https://youtu.be/c2Rfzao-oRI

Video 9: Individual Video Recording of Teacher Interviews Performed Before the Viewing of the VR Content Referring to the Label IA5 - Stakeholders Affecting Play.

Teachers were talking about which kinds of play were being allowed at their centre and what they had have was allowed at other centres. Their centre does not allow gun play, while some other places do, managing it with strict rules.

It was apparent that some teachers found that educating children in this time of their lives is very important and it was also suggested by a teacher that some ECE teachers like to sit with children and teach then as in some primary schools, enforcing a lot of structure. Teachers expressed conflicting views regarding parents' focus for their children: some suggested that most parents do not understand the dispositional learning that occurs through play and are expecting focused academic learning, while other teachers pressed for the contrary, that most parents understand dispositional learning and the benefits play offers for learning.

The former view was exemplified by noting that parents get very excited if they see children sitting at the table writing their names as opposed to when they see them involved in free play. A teacher mentioned that she explains the benefits of dispositional learning through play to the parents who are more academically oriented and thinks that educating parents about it is important but difficult, as society's current prevailing views are to blame for the rise of the academic expectations in ECE causing peer pressure on parents for their children to perform academically. This pressure is then placed on their children and teachers. It was also suggested that some of the academic expectations originate from school environments and are endorsed by school boards and the government, including National Standards (which were still in place at the time of the interviews). However, the teachers were not unanimous in their views regarding this issue, as it was also considered that schools want preschool children to learn social, communication and independence skills.

School readiness at the centre is according to teachers being expressed through centre literacy and maths environments, group times and planned experiences, as well as by supporting self-regulation, independence, social competence, communication and

selfcare skills. It was also said that school readiness is being achieved through dispositional learning through play.

Teachers agree that there is a high expectation put on centres to set goals for children and evidence their progression, but that there is also an expectation by the curriculum leaders of the organisation to support children to be able to be engaged in prolonged periods of free play.

A teacher noted that the Education Review Office (ERO) is modifying its expectations to reflect the changes in the curriculum.

https://youtu.be/isrebkungDA

Video 10: Individual Video Recording of Teacher Interviews Performed After the Viewing of the VR Content Referring to the Label NA5 - Stakeholders Affecting Play.

A couple of teachers thought that parents might benefit from using the immersive video to learn about play. They also thought that they might be critical of some things they saw, but nevertheless it would be interesting to hear what they said. Another teacher noted that this might change the minds of many parents about play, but perhaps not all. She believes that technology itself might be an incentive for them to engage.

Another teacher noted that parents need to develop a broader understanding of play and that teachers should be explaining to them what they are doing; as the teacher said she had had a parent tell her that their child should be writing their name, rather than just play all the time. She thought that parents should stop listening to other people and invest in their child by learning more about play. Another teacher agreed but, reflecting on her own heritage and previous views, observed that the educational and cultural background of the parents needs to be considered. Another teacher noted that some parents have a fixed mind-set and it is very hard to convince them otherwise: what the

teachers say is of no value to them and they are hard to work with, specifically in terms of the curriculum.

6.3.6. VR Causing Changes in Attitudes

These next labels were joined into a separate video and relate to teachers talking about their experiences with the VR technology, while they were watching the immersive video. Teachers talked about VR causing changes in their attitudes for 29.25% of instances and for 30.55% of the video. In comparison to other VR categories in this section this one was the most talked about, illustrating the willingness of the teachers to talk about this topic, and how much they had to say.

https://youtu.be/jX3Pg0_WLyA

Video 11: Individual Video Recording of Teacher Interviews Performed After the Viewing of the VR Content Referring to the Label VA1 - VR Causing Changes in Attitudes.

A number of teachers' attitudes were challenged and in several cases caused immediate changes in their thinking, while others kept them reflecting on what they "saw". A teacher commented on how many questions the teachers asked the children during their play time, which she found interesting and not something she had been consciously aware of before. Several teachers watching the immersive video realised that when teachers are not constantly watching the children, the children behave differently and some very interesting interaction surfaces that would not have occured otherwise. A teacher reflected on herself and noted that she also acted differently when observed, as she would behave the way she was expected to. Through this realisation she was able to relate to a scenario with the children observed in the immersive video. She also said that how some of the observations had reinforced certain beliefs she had already held about free play. An important observation that resonated with all teachers was the notion of letting children guide their own play. Teachers should not take play over if

they participate, as this changes it, while creativity and imagination diminish, and sometimes play ceases completely. Some teachers said they had known that before, but that the experience with the immersive video made it a lot clearer; this was apparent in how well they were all able to articulate it. For example, a teacher noted how a child kept returning to a particular teacher and attributed this to the fact that she was valuing the child's play. Another teacher was under the impression that teachers consistently let children lead their own play and that they were giving them a lot of space to play and was very surprised that this was not what she saw in the video.

One teacher was proud of how well she interacted with the children and how she was supporting the children within the play; however, she also noted that she could have spent more time with the children rather than worry so much about resetting and cleaning the environment on her own, as she could have been involving them in these activities.

The experience with the immersive video made some teachers think about their past, including their study, their personal cultural practices, and their childhood. These connections with their past had affected their current thinking about play. For example, a teacher talked about how all she had needed for a great play experience in the past was a stick and a box, and this recollection was making her endorse play with open-ended resources in the present.

Teachers also though a lot about the change in the environment and these comparisons between the environments seen in the immersive video and the environments in the present made them draw certain conclusions about their effectiveness. For example, a teacher was talking about a resource being placed by the door and said that she would have not thought about placing it there at all if she had not seen it. She found it very interesting that she was able to revisit a past experience in such a way. Another teacher went back to the room after observing the environment in the immersive video to intentionally compare it with what she saw and noted that it is better set up than it had

been before. This highlights how the teacher tested her current attitude and confirmed it after reflecting on the new information.

Some teachers commented that the immersive video made teachers more aware of what they were saying and doing in their interactions with the children in the present, after the viewing. They found the immersive video a very effective tool for self-reflection, that prompted them to think about what they could have done better and also for observing other teachers and learning from their strengths. One said that she would share the experience she had had with the immersive video and what she had learned from viewing it with her team. She also noted that she was thinking a lot about how to create the best balance between child-led free play and the her role as a teacher. Another reflection focused on comparing the teacher's practice before, as observed in the immersive video, and at the time of the interviews. The teacher now saw her earlier assumptions as wrong. She had once seen some aspects of free play as problematic, but did not see them that way anymore.

6.3.7. **"Seeing" Play in VR**

The "Seeing" play in VR label was the third most prominent topic with the teachers, and was talked about 17.01% of instances for 15.59% of the time.

https://youtu.be/5HGk3J_gwtg

Video 12: Individual Video Recording of Teacher Interviews Performed After the Viewing of the VR Content Referring to the Label VA2 - Seeing Play in VR.

Teachers noted on several occasions that they were able to "see" play, often using the literal verb "to see". Techers showed that they could in their own subjective ways "see play". They saw the way children play when the teachers are not hovering over them and the interesting interactions that manifest themselves in such circumstances. They gave many examples of when play was seen as run by the children, or in some cases

by the teachers. Teacher were able to observe how children's engagements with play were changing and what children's narratives of play and intentions in play were. Children's eagerness to play was observed, when children were contributing their ideas, and teachers being involved in play, including when they were teaching from within play. Importantly, teachers said that after watching the immersive videos they were able to see play through the child's lens and this enabled them to see play differently. It was also seen that that children were not given as much space to play as the teachers expected to see and they saw that play is more meaningful when children are playing on their own.

6.3.8. Emotional Responses in VR

Teachers talked about experiencing emotional responses at the time when they were engaging with immersive video with 9.52% of instance for 8.55% of the time of the video. Even though these percentages are low, the result is nevertheless very important as it confirms that emotional responses occurred.

https://youtu.be/_o-PxQ_u2pA

Video 13: Individual Video Recording of Teacher Interviews Performed After the Viewing of the VR Content Referring to the Label VA3 - Emotional Responses in VR.

Teachers talked about their emotional responses at several points. For example, a teacher sighed with deep amazement after viewing the immersive video and putting the headset off, and felt the compelled to share something right away. Several said that being an observer without being physically there "felt weird". Teachers also talked about having felt amused at times and some felt nostalgia while watching the children play. Furthermore, they were able to feel the excitement of the children engaged with play. All teachers interviewed expressed a feeling of endearment towards the children,

noting, for example, that they wanted to touch them, noticing how much they have grown, and referring to them as “their babies”, with what they called “Aww moments”.

A feeling of being overwhelmed was also reported by teachers, who said that many different emotions manifested while they were in VR. Strikingly, it was noted that such emotions distracted one teacher from being able to rationally interact with the content of the immersive video for a while, while another teacher entered into a state of relaxation and enjoyment once she got used to the experience.

6.3.9. Immersion (Feeling of Presence)

A feeling of presence was noted in 12.93% of the discussion instances for 11.49% of the full time of the video. This is a significant indicator that teachers felt immersed in the experience with the immersive video.

https://youtu.be/yVCDHdjqJoI

Video 14: Individual Video Recording of Teacher Interviews Performed After the Viewing of the VR Content Referring to the Label VA4 - Immersion Feeling of Presence.

Immersion (feeling of presence) was expressed in several ways throughout the interviews. As teachers were observing the children in the immersive video they felt present in the room and noted that they felt as though they are actually observing the children in real life, but perceived themselves invisible to the children, which was an unfamiliar feeling for them. They enjoyed observing the children in this way. On many occasions teachers had felt the urge to interact with environment. They wanted to tell children how to use certain resources correctly, pick up unattended resources from the ground, touch the children, move to a different location in the space; they reacted physically when children were coming towards them, feeling that some children nearly walked through them, and tried to move out of their way.

They referred their feeling of presence (immersion) a number of times. They said that they had had a sense of being there, a feeling of presence and they had wanted to move around the environment and reported feeling a strange sensation when they were not able to.

A feeling of disorientation in the real physical environment was discussed. Teachers said that they were wondering what direction they would be facing in the real world if they were to remove the VR device. They completely lost their sense of direction, as they faced a different direction in the real world they expected and some did not even notice they were moving around at all until they removed their device; sometimes they even forgot they were sitting in a chair. When someone said the name of one of the teachers in the real world, she thought it had come from the VR world.

Comparisons were made with the traditional video, with the teachers finding the effect of presence and being able to see in all directions to be the major advantages of the immersive video. The ability to turn the head around felt immersive to them, as they realised they could control what they wanted to see. This gave them a feeling of having more freedom, than when watching a traditional 2D video.

The spatial audio was noted as interesting, as it contributed to their feeling of presence, with examples of them hearing the children behind them, then turning around to see that they really were there. The way sound adjusted as they were turning around in the environment was something they noticed as well. They were also able to tune in to some conversations while still hearing others.

It was also reported that teachers found something to focus on, but knew they could shift their attention elsewhere if they wanted to.

6.3.10. **Affordances of VR**

Being very close to the highest within this data set, affordance of VR were very prominent with teacher having talked about them in 24.49% of instances for 27.7% of the time. It was clear that teachers found the technology a useful tool.

https://youtu.be/aQxl3OS5Hcs

Video 15: Individual Video Recording of Teacher Interviews Performed After the Viewing of the VR Content Referring to the Label VA5 - Affordances of VR.

All teachers expressed a strong feeling of presence in the ECE environment and they observed themselves as invisible observers, which presented them with opportunities to see what was occurring when teachers were not there. They had enjoyed just standing back, listening and watching. They were surprised that the camera was ignored by the children and teachers, who seemed to forget it was even there after a while.

Teachers talked about how useful and enjoyable they found being able to see the whole environment from any chosen angle. They chose different focuses in the environment such as the set-up of play areas, display walls and the children. They thought they would be able to learn a lot more by watching it again, as they had chosen a certain area or interaction to focus on, thus missing much else that was happening in the environment.

They considered that this method would be an excellent tool for teachers wanting to reflect on their own practice. The immersive video helped teachers see play from different perspectives which allowed the development of new insights, confirming or challenging their initial thinking about play and the role of the teacher in play. They specifically talked about instances of when to intervene and when not. It made them more aware of what they were saying to the children after the viewing. They noted a

marked difference of being immersed in the environment through the immersive video in comparison with watching a traditional video on a flat screen.

Teachers reflected on the possible uses of this technology for them and other people such as parents and primary school teachers. They thought it would be a great transitioning tool, where new entrance teachers could learn about the child by experiencing their interactions in the centre environment. They also thought it would be a great tool for reflecting on teacher practice and children's behaviour in staff meetings. The camera could be used inside and outside to learn more about the dynamics of the centre as whole. It would also save teachers a lot of time, as it captures so much.

Different teachers had different focuses and different responses to the immersive videos, but all of them thought that the technology was remarkable.

6.3.11. Limitations of VR

Teachers spend the least time talking about the limitations of the technology at 6.8% of the instances for 6.13% of the time, but they did identify some, nevertheless.

https://youtu.be/Qowzd_n6-ME

Video 16: Individual Video Recording of Teacher Interviews Performed After the Viewing of the VR Content Referring to the Label VA6 - Limitations of VR.

Some teachers experienced Virtual Reality sickness. Some felt it more than others, but it seemed to be stronger with teachers who were susceptible to motion sickness. One teacher felt a bit claustrophobic and disconnected from reality with the headset on, as she does not like small spaces. She said it felt enclosed to her, which she disliked. Some teachers felt some further conflicting sensations between reality and virtuality.

A couple of teachers noted the possibility of the researcher bias in terms of the chosen play experiences that were included in the immersive video. They thought that a wider variety of experiences for a longer time would have helped alleviated the presumed bias.

A couple of teachers said that at times they could not hear the conversations well, due to the noise the children made. Some conversations were taking place further away from the camera and due to the noise of the room they were not being recorded clearly enough to be understood.

A teacher suggested that it would be beneficial to see it again, as part of the first time she watched she was overwhelmed with the experience.

6.3.12. Movements of the Head

As teachers viewed the immersive videos, their movements were recorded. Observed reactions could signal the intensity of the play they were experiencing. Teachers were quite active throughout their engagement with the immersive video, where at least one teacher was physically responding (moving their head) to the video in some way for 63.67% of the monitored time. A teacher was moving on their own 28.11% of the observation, two teachers at once 19.71%, three at once 11.33% and all four 4.52%.

6.3.13. Movements of the Body

Instances of moving the body (excluding the head) were lower at 46.12%, with one teacher moving on their own 29.44%, two together 12.92%, three 3.35% and all four 0.41%.

6.3.14. Facial Gestures

Facial gestures were dismissed from the data set, as they were too hard to monitor, with the headset covering most of the face and with the teachers facing away from the camera for a significant amount of time.

6.3.15. Vocalisations

There were no vocalisations observed.

6.3.16. Facing the Same Direction

This data set was generated while the researcher was analysing the data, as he noticed the significance of the fact that multiple teachers were facing the same direction for longer periods of time, demonstrating a strong interest in a particular event transpiring in the immersive video. As all teachers started watching the immersive video facing the same direction, it can be deduced that as they were turning around and then facing the same way, they were in fact also facing the same event in the immersive video. Instances were coded for when three or four teachers were facing the same direction, deeming the even they observed significant, as it captured the attention of most of the teachers simultaneously.

Throughout the viewing of the immersive video there were 53 instances where 3 teachers were facing the same direction for a total time of 5 minutes and 36 seconds, which accounts for close to a third (32.72%) of the video. Consequently for 67.28% of the video the focus of the teachers was divided. It was however interesting to note that all teachers faced the same direction for a significant amount of time at 4 minutes and 46 seconds that amounts to 27.87% of the video. As all teachers faced the same direction for only 28 times (in comparison to 3 teachers 53 times), the events all teachers observed must had been considerably more interesting as they watched particular events for significantly longer periods.

6.3.17. **Play in Learning Stories**

The data show that teachers' focus on assessing learning based on the expectations exerted by the curriculum and educational leaders have marginally persisted after the viewing of the immersive video, as teachers continued to focus on qualities and abilities of the children while engaging them in formal learning activities and setting curriculum-based outcomes with developed next steps.

However, major changes were recorded in terms of involving play in assessment as the mention of play had significantly increased, even though it was in most learning stories still employed to support the achievement of curriculum goals. Teachers have however started to promote play as a self-actualising tool and developed a strong appreciation for observation of children in play.

6.4. Discussion

The following segment will interpret and discuss the significance of what was discovered by interrogating the theory that underpins this thesis. The discussion will be structured in line with the analytical framework under the phases of conceptual processing, followed by a philosophical interrogation of the results with Heidegger's concepts of *Enframing* and *poiesis* for both play and Virtual Reality technology.

6.4.1. Conceptual Processing Discussed

In the following subchapters I will explain how the developed concepts of conceptual processing that underpinned the analytical framework were expressed and realised in the empirical part of the study, through the engagement of the teachers with the Immersive Video.

6.4.1.1. Habit / Attitude (Ignorance) Stage

This stage describes the initial views, habits and attitudes (Dewey, 1986; Varela et al., 1991) of teachers regarding the teacher's role in play before they had had any contact with the immersive video. In the first interview teachers explained that their role in regard to play was to provide opportunities for children to engage in play, for group interactions, facilitate learning, encourage, role model and support children verbally and by making the environment, equipment and resources available to them. Further, they stated that the focus of the teachers should be to help the children to become socially competent, confident in who they are, and able to develop relationships and basic literacy and life skills; all these are going to be absorbed through play.

During initial interviews (before the viewing) the teachers addressed mainly the external factors affecting play, such as the environment (28,03% of the time), the curriculum (18.47% of the time) and other stakeholders such as parents, managers and policy makers (27.43% of the time) as shown in Table 3.

Another interesting finding showed some contrasting views between teachers about certain conceptions about play, as they would have had different experiences with the world, and hence had developed different views of the worlds (Merleau-Ponty & Landes, 2012). These conflicting views revolved about their role as a teacher in play, setting and achieving children's goals and parents' focus for their children, including where these focuses originated from.

6.4.1.2. Contact With the Senses (Perception & Motor Response) Stage

While teachers were viewing the immersive videos, their movements were recorded. These observed reactions can signify the intensity of play being experienced with their senses (Heim, 1993). Teachers were quite active throughout the engagement with the immersive video, physically responding to the video in some way for at least 63.67% of the monitored time, meaning that at least one teacher was moving their head, with similar findings for the movement of the body. These results are important, as such physical responses prove that the contact with the senses was established and that the physiological feelings were present (Richir et al., 2015), confirming the "perception" and "feelings" stages of the conceptual processing.

Furthermore, in the interviews after the viewing of the immersive video, teachers confirmed seeing play from different perspectives, enabling them to develop new insights into play. This confirms that multi-sensory and cross-modal features of the immersive experience contributed to their changed perceptions, as suggested by Mitchel and Weiss (2011) and that the engagement with virtual reality enabled them to see phenomena from different points of view, which is a characteristic of Heim's (1993) metaphysical laboratory.

As throughout watching the immersive video three teachers were facing the same direction for a third of the video (32.72%) and four teachers for a bit less 27.87%, it can be concluded that the same sensorial input they experienced caused similar

responses (focus and interest) for only around one-third of the time. Ascertaining that two-thirds of the time teachers had different subjective physical responses to the same sensorial input brings to light the subjective nature of this research that phenomenologists (Heim, 1993; Husserl, 1973; Merleau-Ponty & Landes, 2012) have stressed.

6.4.1.3. Feeling (Affection) Stage

In the interviews after they interacted with the immersive video, teachers talked about a range of feelings that they had experienced during the viewing, such as amazement, strangeness, amusement, nostalgia, affection, relaxation, enjoyment and feeling overwhelmed. Many teachers said that emotions they had felt towards the children made them want to interact with them and teachers were even able to project some of the feelings the children felt on themselves, which in some cases triggered further nostalgia. Heim (1993) is adamant that such feelings perceived in virtual reality can abruptly awaken the inner self, with the combination of physiological and affective feelings transforming the core being of the individual. However, it is also worth noting, that at times their emotions distracted teachers from being able to interact intellectually with the content of the immersive video.

6.4.1.4. Interest (Craving) Stage

The viewing of the immersive video had a demonstrably profound impact on the teachers' focus in the discussions about the different narratives about play. As noted, this stage is marked with a feeling of imbalance in the person and it arises when there is a conflict between current attitudes and what is being perceived through the experience. This was clearly evident in the example where a teacher expressed the imbalance the experience caused for her regarding play, saying as soon as she took the headset off: "I do not know what to make of this now," referring to teachers asking too many questions and feeling that these disturb the natural progression of play.

According to Dewey (1986) this results in the experience becoming a motive force that, through a newly developed curiosity and interest, brings forth a desire to restore balance in the mind by bringing meaning to the experience.

Such invigorated initiative and openness to talk about this topic was also evident in the rest of the teacher in the second interview. Teacher's ability to articulate their notions of free play improved significantly, and drew connections to experiences gained from the immersive video, as well as their prior real-life experiences. The fact that teachers were bringing up free play and the role of the teaching in free play much more frequently in the second interview suggests that an urge to talk about the topic developed, again explained by Dewey (1986), where the individual is dissatisfied with the disequilibrium in their cognition and is using reasoning to make sense of it and re-establish the balance by allowing for new insights to settle in their minds. Teachers spoke less often and for a shorter time in the second interview about factors external to play such as space and time to play, play in the curriculum and stakeholders of play. In some cases, their interest in these topics had dropped by as much as 50%. This strongly suggests that the personal experience they had with play through the immersive video pulled them with the reins of causality of conceptual processing towards a place of reflection (Varela et al., 1991), which is supported by the comments that what they saw was not what they expected to see. It is also important to acknowledge that different teachers had different focuses and different responses to the immersive videos, which can again be explained by personal subjectivity. The variability of focuses was shown by teachers having looked in different directions for two thirds of the time they were observed watching the immersive video. The events all teachers observed at the same time must have held considerable interest, as they were also observed for longer.

6.4.1.5. Grasping (Reflection)

At this stage grasping occurs through reflection, several teachers stated that being placed immersively in the environment and not being able to actively engage with the

children forced them to stand back and observe, which created a place of reflection for them. As a tool for self-reflection, the immersive video prompted teachers to think about what they could have done better and allowed them to observed other teachers and learn from strengths. They also reflected on their own past experiences, their childhoods and cultural backgrounds, while comparing their current teaching practice and their learning environment with the ones seen in the immersive video. As past experiences are brought to the present a network arises, built from personal strands of subjectivity and connected into a web of intersubjectivity where present and past meld together (Merleau-Ponty & Landes, 2012). This can be seen as strong evidence that the virtual space can be, as Heim (1993) suggested, a space for reflection that enables seeing alternatives, rather than redundancy (ignorance).

A number of inconsistencies arose between their initial beliefs and what they saw in the immersive video and invited reflection as a tool to make sense of the uncertainty that bothered their minds. In some cases this caused some apparently immediate changes in their thinking, while others kept reflecting about what they 'saw'. For example, teachers noticed through the immersive video that they were consistently adding their own ideas to the play of the children, which they did not like. They also observed that safety concerns were prevailing over enabling risk-taking in free play. Observing changes in the environment using immersive videos proved to be an effective prompt for reflection as well. Several teachers wondered about what the teachers observed in the video were thinking during their interactions with the children, illustrating the emergence of projected metacognitive thinking, where the teachers were not only able to think about their own thinking, but also to empathically interpret and project the thinking of others onto themselves. This was apparent when a teacher was able to clearly see and make sense of what the teacher in the video was trying to teach. According to Husserl (1992) this ability could be described as a transcendental structure of experience: "[I]t is absolute subjectivity and has the absolute properties of something to be designated metaphorically as 'flow'; of something that originates in a

point of actuality, in a primal source-point and a continuity of moments of reverberation" (p. 79). Heim (1993) applied this concept to virtual reality and described it as an extension of the subjective consciousness beyond the ordinary limits of awareness, instilling the observer with an "esoteric" lens of insight. This would explain the absolute conviction the teacher employed when talking about her understanding of another teacher's actions. This is further affirmed by the fact that after the viewing of the immersive video teachers' learning stories exhibited strong appreciation for observation of children playing. This level of interest had not been apparent previously in their stories. Finally, as teachers were testing their current attitudes by reflecting on the new information they acquired through the immersive videos they either accepted or rejected that information. An example of this was when a teacher looked compared the environments and eventually said that she liked "how it is now, better," her voice expressing finality.

6.4.1.6. Formation of New Attitudes (Becoming & Transcendence)

The teacher's engagement with play through this immersive process led to significant shifts in their ability to characterise play and their role. During initial interviews teachers were mostly focused on the external factors affecting play, such as the environment (28,03% of the time), the curriculum (18.47% of the time) and other stakeholders such as parents, managers and policy makers (27.43% of the time) as shown in Table 2. However, by the second interview teachers' responses shifted from an emphasis on external factors towards the internal factors of play, such as free play and the role of the teacher in play. The focus on the teacher's role in play increased from 17.14 to 38.33%, and the time they were seen to be talking about it increased from 12.77% to 35.8%. This was the stage at which teachers' previously contrasting conceptions of play began to intersect. For instance, after viewing the immersive video their thinking converged about topics such as their role as a teacher in play and about setting and achieving children's goals. Teachers were also able to see the curriculum

in action through the immersive videos and were able to determine when intentional teaching was occurring through play.

6.4.1.7. New Mode of Being (Birth)

Teachers noted that the immersive videos made them reconsider certain aspects of play, that they were now thinking differently about play in some way, and that on some occasions what they were thinking prior to their immersive engagement was not what they were seeing in the immersive experience. This confirms the value of the experience value for the ECE teachers, because this can only be judged by the impact it has on a person (Dewey, 1986). Dewey (1986) sees this concept as physical, intellectual and moral growth, when a new situation arises that shapes a new mode of being. Some of the new attitudes that emerged or were strongly reinforced as a result of engaging with the immersive videos included the teachers deciding to give more space to the children, and if they joined in with the children in their play to do so without taking it over; they considered that adults were asking too many questions and noted that play looks different when adults are not present.

The focus of the teachers had clearly shifted away from free play as a tool for learning towards a much stronger focused on it as a self-actualising tool. Another shift in thinking was highlighted by a move from conflicting statements of teachers before the viewing of the immersive video about when to intervene in child's play to an awareness not only of when but also how teachers can get involved, after the viewing. Consensus was also established after watching the immersive video that teachers should not take play over, but support children's learning while participating as playmates. They noted that when play is taken over by an adult, children's imagination and creativity decrease and, in some cases, play stops altogether; and conversely, when teachers verbalise genuine interest and show that they value children's play it enriches and reinforces that play and enhances children's creativity. While teachers had felt that there was a good balance between child-led and adult-led experiences at their centre and that they were

giving the children a lot of space and time to play, the viewing of the immersive video changed their mind.

It is worth noting that these realisations have been categorised by play theory (Education Review, 2015; Holst, 2017; Sutton-Smith, 1997; Whitebread & O'Sullivan, 2012) as fundamental characteristics of play, which teachers were able to see and explain by viewing the virtual representations of play. Furthermore, it should also be remarked that a number of teachers have gained the same or very similar insights about play from the immersive video.

It is apparent that these changes in attitudes have solidified with the teachers, as major changes were recorded in terms of involving play in assessment. Teachers were consistently mentioning play and promoting it as a self-actualising tool for learning and development, with many instances recorded where teachers did not feel the need to include links to curriculum outcomes.

6.4.1.8. Conclusion of Experience (Death)

A teacher suggested that engaging with the same immersive video on different occasions might give rise to different, or further, understandings about play and that using it at a staff meeting, for example, might be immensely useful. The conflicting views of teachers noted in the first interviews had evolved into collective understanding, enabled by the views being challenged and reflected on by their engagement with the immersive video, which had made teachers more aware of what they were saying and doing during their interactions with the children.

Hence even though the experience itself concluded, for the teachers it provoked an openness to possibilities for further experiences that would have otherwise not been considered (Dewey, 1986).

6.4.2. *Gestell* and *Poiesis* in Action

In this section I would like to interpret the analysed results in relation to Heidegger's concepts of *Enframing (Gestell)* and *poiesis.* In my theoretical examination and interpretation of play through these philosophical notions, I have come to establish that the default state of play in our contemporary world is *Gestell.* For this to be true, the initial interviews would have needed to include views, attitudes and discourses that connotate the *Enframed* way of being and experiencing play as a standing reserve intended to achieve pre-established standardised goals. Following this premise, if the engagement of teachers with the immersive video had brought about *poiesis* between the teachers, the technology and play, the second interview could be expected to express a shift away from viewing play in an *Enframed* way towards newly established attitudes and towards diverse ways of "seeing" play. Therefore, I will next compare the main findings of the thesis to these phenomenological and metaphysical notions. Later I will also investigate how successful the technology was in enabling *poiesis* as a saving power for revealing *aletheia* (Truth) of play.

6.4.2.1. Play Liberated

As at a philosophical level *poiesis* can be seen as a liberating force that activates the reflective power of individuals through a practical engagement with a *poietic* act (Whitehead, 2003), it is apparent that, in the case of this study, for *poiesis* to occur. certain conditions needed to be met in order to enable alternative ways of seeing of play within a newly established metaphysical laboratory of unitary multiplicity. These conditions are not limited to a deep involvement of the mind that is open to reflection and emotion, and the presence of the sensuous body in an engagement with phenomena, but also demand a shift in attitude away from the *Enframed* state of limited Being, through a facilitated escape from the system. These and further conditions are going to be looked for in the responses of the teacher participants in this study.

A clear shift from *Gestell* to *poiesis* can be noticed when considering the abrupt shift away from play as a tool for learning towards a much stronger focus on play as a self-

actualising tool, as seen in Figure 2 and shown in 6.2, Making Sense of the Data, in the sub-sections 6.2.1. Free Play and 6.2.2. Teacher's Role in Play. This finding alone brings with it multiple implications when considered according to these two notions. Firstly, the fact that teachers initially considered play primarily as a tool for learning that was going to be used for achieving external educational agendas shows that at this point play was seen as a standing reserve, a resource ready to perform its function of producing learning. This strongly suggests that my proposal that the default state of play in our contemporary world is *Gestell* is true.

After the viewing, the teachers' attitudes changed, demonstrating a shift away from the *Enframed* "seeing" of play to regarding play from a different viewpoint, one that does not necessarily comply with the wider system. Additionally, what is even more affirming is the fact that this change was abrupt: "Heidegger's play of Being, the revelation of Being will come about by a 'revolution' also, a sudden 'turning about'" (Caputo, 1970, p. 39). Play becoming a self-actualising tool for teachers, endowed with agency and liberated from its ordered and objectified state. For such a profound and immediate change to have occurred in the teachers' viewpoints, so that they overcame the "readiness-to-hand" mode of being (Ruin, 2012), must have been enabled by something equally profound, perhaps even with a sense of *poietic* disclosure.

The research also made another *poietic* transformation apparent – a restoration of the significance of people as subjects in the dynamics of play. As Gestell subsided, teacher and child as objectified resources ordered by the power and control of the system were able to become subjects by assuming agency and the central role in the process that is play.

In my study, this could be observed in the abrupt shift of teacher attitudes away from the teaching and learning focus of having to achieve objectives in the curriculum towards an affirmation of their purpose and role in play, as seen in Figure 2 and illustrated in the sub-section 6.2.5. Stakeholders Affecting Play. The teachers'

understanding of when and how to get involved in play appeared to me as a transformative revelation and evidence of the formation of indisputable truths regarding play, demonstrated by their solid confidence in their newly established beliefs. Perhaps this sturdiness of newly established attitudes shared by the teachers is how *aletheia* reveals itself. A move from *Gestell* to *poiesis* also marked a shift for the child from being a cog in the gears of the progressivist ideology to becoming play's main actor. In this process, teachers' perspectives on children changed from regarding them as necessary accessories to learning objectives to seeing them instead as play experts and the driving force of the experience the teachers wished to become part of.

After teachers watched the immersive video, they were emphatic that adults should not take play over, but instead support children while they were involved in play with them. This affirms two important points, one of *Gestell* and one of *poiesis.* Teachers said that they felt uncomfortable observing teaching that entailed situations where adults made children's play their own. Their distance for such circumstances could be explained by considering that through the immersive video they were able to "see" past the limitations of *Enframing* and recognise the adverse effects that such practices had on play. Teachers were able to identify *Enframing*, even though they were unable to explain what it was, as they observed that when play is taken over by an adult with the purpose of imparting their own agenda onto it, children's imagination and creativity decreases and play may stop completely. As another example, while teachers originally felt that there was a good balance between child-guided and adult-guided experiences at their centre and that they were giving the children plenty of space and time to play, they found after the engagement with the immersive video that this was not the case. This shows that they were able to see the state of play beyond its *Enframed* state. Furthermore, *poiesis* was affirmed with suggestions of teachers needing to be part of the play with children, to understand it and to support children in their endeavours. They seemed to have realised that the autonomy of play and children is a prerequisite

for the “turning outward” of play to teachers where it is made dimensional and qualifying the space about it (Whitehead, 2003).

Teachers became genuinely invested in play, saying that they valued and enjoyed the experience of being the silent observer in the immersive experience. En(joy)ing the experience for its own sake signals the presence of the groundless feature of play where play is its own cause (Caputo, 1970). While they were not able to actively contribute to the observed play experiences, they were nevertheless being participants in the dynamics of play, through their invested interest and emotions. This answered my question about what attributes an observer of play needs in order to “stand in the truth . . . [that is to say] in the origin that has revealed itself to him in the poietic act," (Whitehead, 2003, para. 31). I conclude from this that the observer needs to be involved with play sensuously, cognitively and affectively, exhibiting a genuine interest in play, and valuing and enjoying the experience in the moment with no end (outcome) in mind. Teachers got to understand that their task “is to open a realm of possibilities for the student, to encourage them to think within—rather than from without—the obscurity that thinking exposes,” (Mika, 2016, p. 829).

While teachers found it hard to describe play initially, they found it much easier to talk about it and its features after the viewing. As long as the teachers were looking at play from an *Enframed* perspective, they were unable to see beyond the system they were a part of (Heidegger, 1996), therefore they were only able to effectively discuss play from a progressivist rhetoric of play. However, their increased ability after the viewing to understand and enquire into play beyond this rhetoric suggests that something about play (perhaps *aletheia*) had revealed itself to them. This mysterious “excess” cannot be accounted for rationally. Mika (2016) related it to Heidegger’s speculation on mystery that assumes a “certainty of the unknown”. For original thinking to manifest, an openness to strangeness and mystery is advantageous, as in these perceived limits lies true potential for new knowledge to be acquired.

I argue that the results of this thesis include examples of this potential being realised. On several occasions, teachers felt overwhelmed with what they saw in their experiences with the immersive video. This feeling arose for them as a reaction to the unknown, or perhaps even as a response to the realisation of the unknown: "I don't know what to make of this," a teacher exclaimed, as she removed the VR device from her head. The teacher came to see something that exists outside the *Enframed* system and was stunned by the wasteness of the "abyss" she encountered. The reaction on her face showed that she was trying to grasp education beyond what she was taught through/by the system of *Gestell*. She may as well have asked herself the same question, Mika (2016) did: "But how are we to apprehend education as an exercise beyond its natural inclination towards Gestell?" (p. 828).

Teachers participating in the study faced the same difficulty answering that question. While they were able to improve their articulation of play after the viewing of the immersive video, they struggled to articulate how they got to those new realisations about play. Teachers knew it occurred during the viewing but were unaware of the processes they went through to arrive at their discoveries. Perhaps, Mika (2016) suggests, there are aspects of education that we are unable to comprehend with our analytical mind as this is not self-evolving but is instead reliant on Being. Consequently, this understanding of understanding is groundless as it is reliant on Being and can then only be comprehended poetically by being. This understanding of understanding and thinking about thinking are not conventions of western thought, as Mika (2016) affirms:

> Neither student nor teacher, at least in Western societies, is really taught to think about the limits of their own thinking, to speculate on what lies between and beyond their representation of a thing, the thing itself, and the thing's interrelationality. Poetic thinking as the later Heidegger would have it is thinking that strays away from the thing being contemplated, whilst residing within its incomprehensible influence. (p. 829)

The groundlessness of play revealed itself to teachers in another way also. Teachers suggested that they would learn more if they were to engage with the immersive video more than once. This craving seemed to have evolved by them knowing that there was more to be learned, more that eluded their full comprehension with the first viewing. "There is so much to see!" a teacher exclaimed when, much like play, the immersive video revelled something, but at the same time also withheld something. Play may, consequently, then also be a manifestation of *poiesis,* a way of revealing Being.

Being reveals itself differently to different people, which explains why teachers saw some aspects of play differently, while the essence of play (Being) remained consistent. Before the viewing of the immersive video, teachers' understandings of play were not only less articulate, but their views, attitudes, and opinions differed significantly from teacher to teacher. These disagreements dissipated after the viewing, perhaps because in this poietic engagement they observed play and teachers recovered their essential like-mindedness and their common ground (Whitehead, 2003). Even though the same play experiences were watched by teachers separately, the poietic act nevertheless supported the recovery of a consensus.

Engagement with the immersive videos caused several emotions. Whitehead (2003) noted that while the individual is involved in the process of *poiesis* the emotions are heightened, as these manifest when the observer discovers something by engaging with it, and at the same time expresses inarticulate intentionality through their bodily being. Some teachers noted that their emotions reached heights where they became overwhelming, and this barred them from a solely cognitive experience. In addition, emotions aroused memories of previous experiences with play: Dewey (1986) states that experiences that that are connected with strong emotions are the ones that are most transformative. Heim (1993) agrees, stating that such experiences touch our innermost being. These affective links between past and new experiences seem to be another facet

of *poiesis* in action and imply that both cognition and affect play a role in revealing *aletheia.*

Reflection became an integral part of *poiesis* for teachers. As the teachers acknowledged, the immersive videos provided a unique place for reflection that surpassed what they have experienced previously. While engaged with the immersive video they reflected on their own practices, past experiences, their childhoods and cultural backgrounds. Their reflection on what the children were thinking, the teachers they were observing and their own views and attitudes regarding play, calls to mind the notion of unitary multiplicity, suggested by Whitehead (2003). As some teachers were testing their current attitudes by reflecting on the new information they acquired through the immersive videos and either accepted or rejected the new information, they affirmed the experimental features of *poiesis* (Whitehead, 2003) and the investigative features of the metaphysical laboratory (Heim, 1993). The experience was also transformative (Dewey, 1986) and transcendental (Merleau-Ponty & Landes, 2012) for teachers, as the immersive video made them more aware of what they were saying and doing within their interactions with the children in the present, as shown by analysis of the data regarding "Seeing" Play in VR and VR Causing Changes in Attitudes. Teachers seemed to have been "confronted philosophically through a new mode of questioning, and also of listening, through a 'poetic questioning' and a 'thoughtful meditation' (*Besinnung*)" (Ruin, 2012, p. 190).

Furthermore, teachers thought that this tool would also enable their children's parents to "see" play from a perspective beyond its academic value, suggesting that others would also be able to overcome *Enframing*. They believed that this would be successful, as teachers, who already have a good understanding of play, were able to discover a number of different narratives about play that they did not consciously consider before. As noted earlier, they found educating parents about the importance of learning and

developing through free play important but difficult, given some parents' fixed mind-sets, and suggested that parents might benefit from such an immersive experience.

From the above comparison it is evident that engaging with the immersive video brought about substantial changes in teachers' attitudes, thinking, beliefs, insights and conceptions about play. Previously I have elaborated on how Virtual Reality technology is taken advantage of in the modern western world in its *Enframed* state. In the following part I will explore if and how I was able to apply technology beyond ordering it to force out ready-at-hand resources for exploitation, in the sense of aiding teachers in the process of reaching *aletheia* (truth) about the essential features of play, through revealing rather than forcing out. In other words, I would like to discern whether I have in some way ordered play to reveal itself or if I managed to enable its revealing though *poiesis.*

6.4.2.2. From a Standing Reserve to the Saving Power of VR

As stated before, while Heidegger (Ruin, 2012) pointed out the dangers of technology, he affirmed too that it also contains new possibilities that may aid in overcoming *Gestell*. He considered that in this obvious danger inherent in contemporary technologically defined modernity, there also lies a saving potential. In his essay about technology this notion plays an important role, as it affirmed the way in which he wants *Gestell* to be comprehended, "as an "ambiguous" situation of (manifest) danger and (potential) saving at once" (Ruin, 2012, p. 193). I would therefore like to establish whether I managed to apply VR technology in the form of a saving power that enabled a revealing of an alternative insight into play.

By using VR, I attempted to confront *Enframing* philosophically by enabling teachers to access a new mode of questioning, and also by listening, "through a "poetic questioning" and a "thoughtful meditation" (Besinnung)" (Ruin, 2012, p. 190). I think that Besinnung came to fruition in my empirical endeavour in the form of the invisible,

quiet observer who was able to see, listen and feel within a space that allowed for deep reflection by connecting the observer with their innermost being to shift thinking towards perceiving new truth about play. As mentioned, teachers felt as though they were observing the children in real life, but perceived themselves as invisible to the children, which allowed them to stand back and reflect. They also remarked on several occasions that in the immersive videos they were able to see play, often using the literal phrase "to see" and that this alternative was of "seeing" enabled them to comprehend play in the way the child experiences it, thus exposing the child's sense of seeing to their own. In this alternative role of an invisible observer, they were at times presented with play in unexpected forms. As they noted this enabled them to see play differently, which corroborates my argument that the technology was able to reveal diverse ways of seeing play, a seeing that looks beyond *Enframing*.

As mentioned, it was also confirmed that the VR technology engaged the observers in an embodied way, where a combination of sense impressions brought forth a range of thoughts and feelings. Teachers experienced a range of emotions, including amazement, strangeness, amusement, nostalgia, affection, relaxation, enjoyment and feeling overwhelmed. A number of theorist agree (Dewey, 1986; Heim, 1993; Husserl, 1973; Varela et al., 1991) that the involvement of feelings enables connections to be built with past experiences, which the teachers confirmed through their feeling of nostalgia and the fact that they were able to draw links to their past experiences with play. Teachers were even able to project some of the feelings of the children onto themselves, establishing an affective unification and magnification. These examples demonstrate that VR technology hence enabled a transcendence of feelings and thoughts through time and space, which recalled the wisdom of the past to inform the experience of the present, in order to establish new ways of thinking and feeling in the future. These intertwined manifestations and relations between play, the players, the act of playing and the observers seem to me a confirmation that *poiesis* took place. I would further like to affirm the use of the technology as a means of revealing with the assertions of

teachers that the technology has not only helped them to see play from different perspectives but that it also holds the capability to reveal play to parents and others who would benefit in learning more about what play is. They did exactly what Heidegger (Ruin, 2012) suggested - that is to not simply ask "for the truth about technology, but for the truth of and by technology" (p. 193).

I also argue that while the immersive recording I took of play experiences may perhaps be seen as *Enframing*, intended to be ready at hand and ordered, my intentions exempt it from any such classifications. I did not use the immersive video to either compel VR technology or play to manifest in any one particular sense or way to be applied to any single use, purpose, outcome or agenda. Instead I recorded the immersive video in order for play and VR technology to reveal themselves to observers in any way they might. I would argue that, far from employing play and VR technology to further Gestell, I have extensively researched how both are presented in their Enframed states and then sought alternative, diverse ways of seeing and interpreting them for myself and for others. This methodology belongs to me as much as it belongs to the teachers, as I was clearing the way for play to reveal itself to teachers, by creating the conditions for embodied conceptual processing to take place in order for the teachers to experience *poiesis*.

6.5. Conclusions - Answering the Research Questions

This concluding chapter of the thesis will firstly draw from the above findings to answer four of the research questions posed at the beginning. This interrogation will be followed by the implication of the study, which will provide answers to the remaining research questions.

6.5.1. What is the potential for immersive video to transcend existing notions of play for teachers in ECE?

This thesis undertook a phenomenological quest to discover whether immersive video methodology could serve as a virtual looking glass to enable teachers to "see" children's play in the curriculum in order to develop alternative insights about the phenomenon. The results suggest that the answer to this question is affirmative, as teachers reached a number of unique insights regarding play that were different from their assumptions before the immersive experience in VR. The new attitudes towards play that teachers developed strongly aligned with what researchers (Holst, 2017; Larsen, 2015) have referred to as the basic nature of and functions internal to play, such as free play being a self-actualising tool for children's growth and development. Teachers were able to "see" play beyond the way contemporary ideologies of learning and teaching are framing it, enabling them to approach it from different angles and discover new subjective truths. Through the process of *poiesis* teachers were able to de-frame play in the metaphysical laboratory situated in the virtual place. *Poiesis* enabled teachers to transcend the *Enframed* system that locks play into place as a standing reserve for achievement of standardised predetermined learning outcomes, towards an expansion into a multiplicity of subjective views, attitudes, beliefs, values, wonderings and insights regarding play.

6.5.2. What are the specific circumstances under which play discloses itself as a phenomenon to the early childhood teachers through VR?

Teachers' articulation of their role as educators in a play-based curriculum were significantly richer after the viewing and followed the premises of a child-led pedagogy, separated from aims and ideas of adults, including those prescribed by the curriculum. The teachers affirmed that teaching is more effective and meaningful when done inside

the play frame, with the educator as an active participant in the dynamics of play. In this sense I would argue that play revealed itself to the teachers in and through the immersive experience, where "one of the walls in play [was] let down and spectators become part of the play's flow' (Holst, 2017, p. 93).

Perhaps this is why teachers "felt weird" becoming the "invisible observer" watching virtual play experiences through the cybernetic looking glass, simultaneously feeling both immersed in the dynamics of play – contrary to the basic dynamic of play – and being unable to actively respond to the provocations of play, and consequently feeling an unnatural sense of semi-disconnect. This internal paradox constitutes both an affordance and a limitation of immersive videos, in that it provides enough immersion for teachers to perceive the dynamics of play while at the same time they are unable to establish a platform for responding in the play interactions physically. However, once teachers got accustomed to the paradox, an interesting alternative state of being manifested itself, created from this unique combination of circumstances, described in different terms by different researchers as: *poiesis* (Heidegger, 1996), unitary multiplicity (Whitehead, 2003), metaphysical laboratory (Heim, 1993) and transcendence (Merleau-Ponty & Landes, 2012). What would have been a regular day for the teachers in the physical world, with their minds occupied by the actions and reaction of their intentional teaching, was transformed into a situation where their inability to actively interact with the play experiences freed up their mental capacity and released them to become an invisible observer positioned inside the play frame. The attainment of this state was only possible due to a dual state of being, where their esoteric self became part of the play while their mental self was free to reflect about what they could see inside the play frame.

6.5.3. What is the impact of teachers' altered perspectives in relation to pedagogical practice concerning play?

Teachers reports several important insights that they had gained, as well as some benefits of becoming the “invisible observer”, as they referred to themselves in these phenomenological encounters.

Their engagement with play in the virtual space made them more aware of when and how to become part of the flow of free play without interrupting the agency of children and their capacity to sustain the play frame. Teachers learned how to pass through play’s borders and align themselves with the warped time and space that, according to Huizinga (2004), act differently inside the play frame. Teachers in their role as “quiet observers” came to understand how their pedagogy could be applied in parallel to the flow of play, so that play becomes a self-actualising tool for growth and development of children and adults alike. This was enabled by the revealing of the dynamics of play and play’s pedagogical significance to the teachers. Consequently teachers were enabled to understand that play plays out through the participants (Larsen, 2015) and reveals itself through participation, even when the play mode is bystander play.

Understanding when and how to intervene in play as an adult relates to another important pedagogical insight that the teachers developed. They noted the importance of letting children lead their play, without a teacher asserting their own themes, reasons and methods of play. They learned that valuable functions of play diminish, or completely disappear, when an adult takes over children’s play. These altered attitudes align with contemporary learning theories such as Vygotskian and Neo-Vygotskyan (Whitebread & O’Sullivan, 2012), that recommend a broad and integrated approach to pedagogy in which adult involvement should be sensitive, because developmental outcomes can be enhanced if the ownership of play stays with the children. As Vygotsky (1967) argued these findings suggest that with such engagements children are setting their own “zone of proximal development” by setting their own level of challenges, while their feelings of control alongside a provision of emotional warmth and security enable effective cognitive challenges and stimulate their development.

Teachers also found that safety concerns were overriding the pedagogical value of play and that such concerns are often misplaced. From their observations of children at play in VR they decided that some teachers were managing play in order to "keep them [children] safe from harm.' Teachers also linked this stance to that of contemporary parenting, noting that parents are also very safety conscious, and saying that this way of thinking is a strong characteristic of the current generation of parents. This aligns with Karsten's (2005) findings that parents of school-age children show a preference for their children to participate in structured sports games rather than free play, while teachers discourage certain kinds of free play such as "rough and tumble play" and "war play", and these contemporary ways of re-framing play combined create a "social trap" (p. 222) for children, severely constraining many kinds of play. Furthermore Mäyrä (2008) stresses that hindering free play where children can negotiate their own culture of play has significant implications for their social and developmental growth. The interactions of teachers with the immersive videos prompted them to reflect on Sutton-Smith's (1997) categorisation of play in contemporary society as either "good play" (Sacred Play) when it leads to orderly attainment of desired goals or as "bad play" (Festive play), classified as disorderly and subversive, which stems from children's interests and needs. Teachers found that rough and tumble play is seen by many as 'bad play', even though it is considered of particular importance for developing a social and hierarchical understanding between boys. Coie et al. (1988) agrees that this kind of play is routinely categorised by adults as "bad play", even though studies (Pellegrini, 1991) show that the amount of time children are involved with RTP directly correlates with their level of success in social problem-solving.

Another fresh insight related to the presence of adults. Teachers found that children behave differently, when adults are not closely supervising their play, or as Marjanovich-Shane and White (2014) put it: "when the footlights are off" (p. 121). This perception echoed the theoretical findings which suggest that it is through unobstructed social interactions away from the gaze of the adult that play reveals itself

fully to the player, while the developmental benefit for the child is strongest and play is at its most effective in providing such benefits. Teachers confirmed that children's play is influenced by the presence of adults, as they are aware of the social and cultural constraints and expectations represented and enforced by adults. Jarvis et al. (2014) additionally found that in the absence of peer-to-peer play children fail to acquire the social and emotional skills needed to develop physically and psychologically. It seems that teachers were able to make these connections subconsciously through their roles as quiet observers.

While learning stories showed a much stronger focus on free play after the viewing of the immersive video than before, the teachers continued to follow the expectations of their superior stakeholder, namely the employers and the prescribed curriculum, by devising and following learning goals in the play-based curriculum. Thus, while the teachers had developed alternative insights about play aligned with the basic function of play, they continued to feel obliged to follow societal rules. White (2011) found the same in her research where, after teachers had acknowledged a different way of writing learning stories, they nevertheless defaulted to their usual way of writing. This suggests that, for free play to be employed authentically in education, many more viewpoints will need to be changed, particularly those of policy makers and educational leaders. The methodology developed in this thesis proved to have the potential to aid in developing such approaches.

6.5.4. What additional contributions can sensory and/or embodied engagements through VR make to teacher pedagogy AND What other contributions may VR hold for teacher pedagogy as a consequence of engagement with VR?

This thesis showed that the immersive video methodology, including the analytical framework, is an effective pedagogical tool, able to initiate alternative insights about

play in adults: therefore, introducing immersive pedagogy to policy makers and educational leaders might, as some of the teachers have suggested, be of similar benefit to them. Arguably, the effects might be by far stronger, as ECE teachers including the participants in this study have already had a lot of personal experience with child's play. These questions are further elaborated on in the following chapter regarding the implications of the study.

Teachers using the VR device to engage with play through the immersive video have outlined a number of affordances, but they also had some reservations about the technology. These affordances and limitations will be examined next,along with my own observations and the views of users internationally to explain how these may have affected the use of VR as a research method.

6.6. Affordances and Limitations of the Study

As this study has highlighted, examining pedagogical insights through immersive representations of first-hand experiences in the virtual world can be achieved with the use of filmed immersive videos. Users of the technology can indulge in specific and targeted experiences in a controlled environment, which provides researchers with a high level of control over the content and the progression of the experience. This fact accounts for a number of affordances and potentialities in various fields of research, particularly in social sciences.

Immersive videos can facilitate virtual excursions to places that would otherwise be inaccessible, due to previously insuperable constraints, whether physical (visiting the inside of a human body), financial (arranging a trip to Antarctica for a large group of people), biological (a paraplegic walking through dense forest) or psychological (a person who is acrophobic wanting to climb a mountain) (Häfner et al., 2014; Sobota et al., 2016). The technology also enables people to literally "walk in someone else's

shoes" by experiencing the world from another person's eyes through an out-of-body immersive experience; this has significant implications for people understanding each other across race, ethnicity, profession, sexual orientation and culture (Bailenson, 2018).

Understanding and researching complex and elusive phenomena such as play, and creativity, as well as cultural, esoteric and spiritual experiences, however, offer additional challenges - especially if these have been mediated through second-hand mediums such as text or other people's explanations. However, when such phenomena are being experienced in an embodied way, alternative connections, understandings and ways of 'seeing' are established (Garrett, 1997; Heim, 1993). Such experiences can be simulated and mediated cross-modally and in multi-sensory ways by using immersive videos. Furthermore, these recorded experiences can be revisited multiple times and by several people, capacitating a variety of research applications and creating novel opportunities in education for reflection on practice.

Teachers in the study noted on several occasions that they were able to "see" play while being immersed in the VR video, often using the literal phrase "to see", and said they could even see play through the child's lens of play, which enabled them to see play differently. They were also able to project some of the feelings of the children onto themselves, which in some cases triggered nostalgia. They felt as though they were actually observing the children in real life; on many occasions, teachers wanted to interact with the environment at first, but later perceived themselves invisible to the children. They were able to stand back and reflect.

It was clear that teacher participants found the technology a useful tool. The effect of "presence", and being able to see in all directions, were judged the major advantages over traditional video. It was suggested that re-watching the immersive video would allow a lot more to be learned from it, confirming the advantages of immersive videos identified by theorists (Trindade et al., 2013a). Spatial audio as a modality of the multi-

modal multi-sensory virtual environment (Mitchel & Weiss, 2011; Wang et al., 2016) contributed to teachers' feeling of presence. The camera was mostly ignored by people, which enabled capturing authentic interactions in moments of time. A marked difference between being immersed in the environment through the immersive video and watching a traditional video was suggested.

Because seeing play from different perspectives had enabled new insights for teachers, they suggested that the technology might help others to learn more about the benefits of play as well. Given that most parents are trying to set academic outcomes for their children, teachers commented that educating parents about the importance of learning and developing through play is important but difficult. Some teachers thought that immersive videos would help ECE teachers to highlight the importance of dispositional play-based learning to parents and school teachers, and the technology itself might be an incentive for them to engage. Teachers identified several other possibilities for applications of the method, including for shared reflections at staff meetings.

Furthermore, in the study VR technologies were able to cause emotional responses for teachers, such as amazement, amusement, nostalgia, affection, relaxation, enjoyment and feeling strange, or, for some of them, overwhelmed.

The theoretical/analytical framework that was explicitly developed for the purpose of this study could be adopted for any future research that may investigate changes in human conceptions when using VR technology in their methodology. The framework is also equipped with backward compatability, meaning that it could also be adopted in video research. The decisions on why and how methods were applied will be discussed in the next section.

While experiences are being simulated in VR, it is important to note that these are representations of experiences (Coyne, 1994; Heidegger, 1996) and not experiences themselves, hence it is not yet clear if phenomena from the real world can be transposed

into the real world accurately enough for them to retain their defining features and if the technology is advanced enough to provide the level of immersion required for an unadulterated embodied cognition. The fact that some of the participants in the study felt slight nausea tends to signal that the body noticed a misalignment between the external and internal senses (sensory conflict). causing what has become known as virtual reality sickness. A feeling of disorientation in the real physical environment was also apparent with the teachers in the study. It has been established that by improving immersion, the sickness caused by VR diminished or disappeared (Suarez, 2018). It should also be noted that the device used in the study (Samsung Gear VR) was not a high-end device, although it was the best mobile option available at the time. High end devices such as the Oculus Rift S and HTC Vive Pro need to be connected to a highly capable computer and a number of tracking sensors, which make its transportation and set-up more difficult, and they are also a lot more expensive (especially if the need for a powerful computer is factored in).

Further limitations of the method have been identified, such as that, at times, emotions caused by the high level of immersion were very strong and distracted teachers from being able to interact objectively with the content of the immersive video. Watching the video again when the teachers got used to the technology might have yielded stronger results. Some conversations in the video were hard to make out, due to the noise children made in the environment. Facial gestures could not be observed due to the size of the head mounted device and were dismissed from the data set. The possibility of researcher bias in terms of the chosen play experiences to be included in the immersive video could not be excluded, as researchers cannot be aware of their own biases.

6.7. Implications of the Study

6.7.1. Implication for Seeing Play Through *Poiesis*

Early childhood teaching practice is permeated with ambiguity (Sutton-Smith, 1997), and children's play is only one example. This study has shown that *poiesis* enabled teachers to de-frame play and develop alternative insights about it. As professional teachers who already have a good understanding of play were able to see it beyond the constraints of framing, I would argue that the effect of de-framing would be much stronger for other stakeholders in ECE who may not have the same informed comprehension of play. As it was noted before, the system of *Gestell* rectifies any perceived lapses that may pose a threat to the system, which was well illustrated by the obligations teachers felt to assess in line with the expectations of the curriculum, where assessment kept its focus on goals. If *poiesis* was to be applied to a wider range of ECE stakeholder - such as parents, educational leaders, researchers and policy makers - the normalisation effects of the *Enframed* system would be challenged to the point where it would collapse, giving rise to open interpretations of play. Therefore, this methodology has the potential to evolve *Enframed* attitudes about play into a multiplicity of meanings across the global.

Furthermore, the phenomenological methodology developed in this thesis will enable researchers of play to examine it beyond the common constraints imposed by ethical considerations, limited access to children at play and the inability to recreate the same conditions within a play experience. As a represented play experience through VR can retain the fluidity of play in the process of *poiesis* within a controlled environment, it is able to move beyond these limitations of traditional research methodologies and methods.

As this methodology has proven to be effective in enabling teachers to develop alternative insights into the true nature of an educational phenomenon such as play, it

could be applied in investigating a much wider range of educational phenomena in ECE, such as culture, creativity, imagination and aspects of the ECE curriculum. The applications of this study could also be used beyond ECE and beyond education, in wider social science researches, where the representation of an *Enframed* social or anthropological phenomenon needs to be de-framed through *poiesis.*

6.7.2. Implications for Immersive VR as Standing Reserve

The technology that was applied in this research is today (end of 2020) already severely outdated, as much better devices have since been developed. These would make the experience more immersive and consequently strengthen all the stages of conceptual processing. Immersive videos themselves have recently evolved into interactive immersive videos, meaning that users could now be presented with choices in their experience that would allow them to branch off into a number of different immersive videos. This capability offers an exciting extension to the application of the immersive video in research, and it creates a need to further develop this methodology for alternative uses - in ECE, in other sectors of education and more widely in other disciplines. This would enable the technology to be used in more diverse ways beyond its standing reserve, allowing people to experience the opposite of its main contemporary function of *Enframing*, and see instead the multiplicity of the world through *poiesis.*

iv. Epilogue:

I want to conclude this thesis in the same way I started it – with a personal reflection. I would like to revisit my thoughts as they were in the introduction and investigate if anything has changed for me. I would also like to reflect on all the knowledge that I have gained while developing this extensive thesis and on some of the surprising aspects of it.

Thinking back to what play meant to me before I engaged with this thesis, I would say that my core attitudes regarding play have not changed. This thesis has affirmed a lot of my thinking and validated my concerns about play, as many other theorists and researchers share them with me. They have also come across the same difficulty regarding the study of play, and it is here that I think this thesis has made its strongest contribution. The strong results seen in the empirical part of the study show that my research method effectively provided a reliable platform to study play without having to intensely objectify it. Much of this success is to be attributed to the basic features of play, in particular the ability to become part of the dynamics of play as its observer. But this does not mean that any kind of observer is able to "see" past the illusion of play. To observe the inner workings of play the observer needs to shift away from the fixed ideologies nested in their prefrontal cortex and dive deeper towards their affective, intuitive "reptilian brain" (Sutton-Smith, 2008). This was in the case of my study strongly affirmed with the fact that all teachers noted, that even though they were the "invisible observers", their emotions were heightened during the experience as they felt themselves become part of play. I have recently learned to affiliate this to an actual identified type of play, referred to as onlooker or spectator play (*Play Encyclopaedia*, 2020). The feature of this play is that learning to play on their own gives children the time to think and explore how their world operates, while it gives them the freedom to use their imaginations. They can also develop their own rules and understandings for play. For me, this explanation clarifies what was occurring for teachers while they were

involved in the immersive video and why it felt strange to them. They all commented that they enjoyed having the time and space to think and explore how play operates when they are not there, while also developing their own subjective understanding of what play means to them. I surmise that the feeling of strangeness they reported was associated with not having been involved with this kind of play in a long time, and this accounted for their feeling of nostalgia.

Looking back at my initial reflection and my brainstorm regarding the terms I associated with play, I find it interesting that all of them have been given meaning theoretically and empirically through the thesis. Back then I thought of these as just some arbitrary expressions of my thinking and feeling, without any deeper significance or consequence behind them. I have since then learned that perhaps everything we think and feel has a profound meaning attached to it if we choose to listen to it. I have discovered that joy and fun, something I thought to be a side product of play, are pivotal for understanding and engaging with play, as they are key ingredients that facilitate a genuine interest in play, a prerequisite for achieving *poiesis* and consequently *aletheia.* Affective feelings and their expression are not given much weight in Western philosophy and its understanding of phenomena. Perhaps this is also another reason why we struggle to connect to such phenomena as play. Emotions were pivotal for the teachers to understand play and I believe that they are pivotal in understanding many other important notions in life. Perhaps, this systemic disconnect with our affective self is also something that makes us susceptible to *Gestell.* This thought of mine is supported by the fact that *Enfrmaing* actively eliminates everything that is beyond its scope of systemically marginalised objects with production value. I have mentioned Heim's thinking a number of times, specifically in relation to learning about phenomena in space that enables us to get in touch with our inner most being. Perhaps if we were more conscious of our feelings there would be no need for a metaphysical laboratory, as we would be able to achieve *poiesis* naturally all the time. What a different world this would be. It would be an exciting world open to any kinds of love,

it would endorse personal freedom through a sense of purpose where everyone could express themselves and explore the unlimited possibilities a word without *Gestell* would offer. As I have just used most of the terms I have associated with play in the last sentence, I can say that it would be a world of free play.

In this world, play and life would be one. This is another concept that I have noted in my initial reflection. I have since learned about the intrinsic relationship between the two and that they are both founded in a metaphysical abyss. Neither life nor play has a ground: there are their own ground, their own cause, they own purpose for being. Many questions about play seem to find their end in this abyssal darkness; however, I have also found that the truth about play reveals itself when the circumstances are right. I am starting to think in the same way now about other notions in life. Perhaps trying to find out by pure effort what we want know is pointless, as phenomena without ground can only be learned about by becoming part of them. To learn about life is to live, to learn about art is to do art and learn about play is to play. However, "to do" these does not necessarily mean that we have to be the ones producing them. For example, we do not need to create an art piece to do art, and we do not need to actively be part of play in progress to play; we are still able to be part of the dynamics of such phenomena by being a quiet observer. I must admit that this concept was perhaps the hardest for me to arrive at, as my initial thinking was that to understand play we must need to play, as there were so many instances where observers were unable to "see" play. My research has however shown that quietly engaged observers can achieve *poiesis* and become part of play itself. Heidegger gave me a few hints as to how this comes to be, but I had to turn to art to fully understand these undercurrents. The teacher interviews helped me to confirm the correct prerequisites for how an observer of play can become a participant in play.

Another concept I initially struggled with is the connection between learning and play. I knew that free play cannot truly be free if its strings are being pulled by a teacher with

educational outcomes in mind, but I was unable to articulate what the role of the teacher as an educator and facilitator of learning is in a space where play is entirely free. My thinking in this regard has shifted as a result of what I have learned from the literature, but only took full shape after I had seen play in action in the immersive video and listened to the responses of the teachers. For me, now, free play involving an adult is play that persists or even increases in its intensity after the adult joins in. It retains its characteristics such as joy, creativity and having no end. I do not think now that there is anything wrong with an adult joining in playing with children - on the contrary I would encourage it. But it needs to be done in such a way that play remains free to flow as it will, and where the adult has no ulterior motive beyond the joy of playing with the children. The teacher should support free play, and let play be the teacher that tells us what we should learn; they should enrich, follow and extend it with their past experiences, skills and knowledge, and follow its thread, and learning will happen and progress naturally.

In terms of the methodology, I was surprised at how well the method worked, and was overwhelmed by the strength and consistency of the results. I was prepared for the teachers to say that they found the experience ineffective and that they could not learn anything further about play by watching this short immersive video. Looking at how the technology has evolved in the few years since I recorded the immersive video, I could now make the experience a lot more immersive and comfortable for the teachers. Today's technology can produce much sharper 360 3D videos with less distortion and better spatial sound capabilities. The VR device I used is now also severely outdated. These facts make the applicability of this thesis a lot more important: if in the short time of three years (2017-2020) the technology has improved this much there must be demand for it. And while the quality of the technology has improved it still serves the same function, hence the robust results of this thesis would only have been stronger if the high-end technology of today (2020) could have been used then.

v. Appendices

Appendix 1: Learning stories before the viewing of the immersive video:

Nau mai, haere mai ki te Ruma Marama Ahisma

Ahisma, welcome to our preschool room. You have settled easily into your new learning environment. You are a kind girl, who cares about those around you and are quick to show kindness to others when needed.

Ashima, you have become an active learner in the preschool room, moving around the room and engaging in many activities. You really enjoy dressing up with the purple dress and dancing around. You have also shown that you enjoy physical activities and are confident in your abilities to climb and jump off boxes and railings.

You have a set of friends that you like to start your day off with, however I have observed lately that you are now feeling more comfortable with your new learning environment and are beginning to make connections with others in the preschool room. We will continue to support you with your new journey Ahisma, and look at ways to ensure that you gain a firm sense of belonging in your new environment.

Story date: 20 Apr 2018. Added by: Kathy Stiles.

The "Cake" Puzzle

Shane, every time something new is put on the table, I see you gravitate to the table area. You are always watching to see what is coming out and you like to be one of first to come and sit down to investigate. Today the alphabet puzzle was set up at the table. You sat down and looked through all the pieces. Shane, you noticed that there were two pieces similar and you put them together on your place mat. You kept looking but at this stage could not find any others that looked similar. Shane, you then went back to your two pieces, picked them up and tried putting them together. Wonderful effort Shane, you did it. You looked at me so proudly. He mohio koe, you are clever Shane!

Shane, once you had done this, you looked at me again, and I said that there were another couple of pieces to finish off your puzzle. I said that you would need to look hard to see if you can find the puzzle pieces that would match the other ones. You went and searched and searched. You would find one, and hold it up and ask me if it was the right one. I would tell you to have a look against your other pieces. You would try it again, then find out it wasn't quite right, and then put it back. During this, we were talking about each puzzle piece and if it would fit into the other ones, and did it have the same picture on it. You then noticed that your friend next to you had the piece that you were looking for. Shane, you politely asked if you could have the piece, which they gave to you. You were excited as you put it together with the other two pieces. Three pieces done Shane, one to go. Searching you went again. Unfortunately you couldn't find it, so I helped you look for it. I kitea e matou, we found it Shane, ka pai! You put the last piece on and it was complete. You looked at me so proudly, and said "look I did it, a cake!"

What learning is happening here?

Shane, you have shown an interest in this puzzle. You have confidently communicated your understanding of where you think the puzzle pieces fit. You have used great communication skills in your discussions with myself, and with your friend next to you when you were asking if you could have that particular puzzle piece. You displayed politeness to others and are learning to express your needs without getting upset. Shane, this has enhanced your whanau aspiration, where you are being supported to become a strong communicator as you interact with others in your play.

Where to next Shane?

This activity has been a great success Shane as it is showing that you are increasing your communication skills with both kaiako and your peers. I will look for more intentional teaching moments that are group orientated. This will continue to help you on your journey of becoming a strong communicator.

Kia whakapehapeha ki a koutou whakatutukitanga

Be proud of your achievements

Nau mai, haere mai ki te Ruma Marama Azalea

Azalea, welcome to Ruma Marama. You have settled so well in your new environment and your curious nature allows you to explore your surroundings with confidence.

Azalea, you are becoming familiar with the routine times in the preschool room. I have noticed that you enjoy group activities as well as solitary play. You are developing your skills to interact with your peers and teachers, which will enable you to build positive and trusting relationships with others.

Azalea, you are developing confidence in your communication skills, utilising these to communicate with those around you. I am looking forward to watching you grow and flourish as a competent and confident learner. I am also looking forward to getting to know your whanau, so together we can make your learning journey fun, meaningful and exciting.




Learning tags:

Being part of their centre

Story date: 11 May 2018. Added by: Varsha Shivangi.

Nau mai haere mai ki te Ruma Marama Kiani

Kiani, welcome to Ruma Marama. You have settled so well in your new environment and your curious nature allows you to explore your surroundings with confidence.

Kiani, you are becoming familiar with the routine times in the preschool room. I have noticed that you enjoy group activities as well as solitary play. You are developing your skills to interact with your peers and teachers, which will enable you build positive and trusting relationships with others.

Kiani, you are developing confidence in your communication skills, utilising these to communicate with those around you. I have noticed that you have a strong interest in music and singing. I spoke to your Mum regarding this and she informed me that you explore this same interest at home. I am looking forward to watching you grow and flourish as a competent and confident learner. I am also looking forward to getting to know your whanau so together we can make your learning journey fun, meaningful and exciting.





Learning tags:

Being part of their centre

Story date: 30 Apr 2018. Added by: Varsha Shivangi.

Putting the skeleton together.

This morning our children got the opportunity to explore and investigate about the human skeleton. This activity was initiated by some children as they found a picture of skull and were curious about it. We got the skeleton out but at first the children decided to scare each other with different body parts. We discussed about the digestive system and explained I to our tamariki what happens to the food we eat. This is what Darsh is trying to explain in the video. This was a great learning opportunity for our children as they were learning alongside each other at their pace. Most important part of this activity was that our children were working collaboratively with each other to achieve the goal.

Story date: 28 Feb 2018. Added by: Varsha Shivangi.

Nau mai, haere mai ki te Ruma Marama

Yogesshwaar, welcome to Ruma Marama. You have settled so well in your new environment and your curious nature allows you to explore your surroundings with confidence.

Yogesshwaar, you are becoming familiar with the routine times in the preschool room. I have noticed that you enjoy group activities as well as solitary play. You are developing your skills to interact with your peers and teachers, which will enable you build positive and trusting relationships with others.

Yogesshwaar, you are developing confidence in your communication skills, utilising these to communicate with those around you. I am looking forward to watching you grow and flourish as a competent and confident learner. I am also looking forward to getting to know your whanau so together we can make your learning journey fun, meaningful and exciting.





Learning tags:

Being part of their centre

Story date: 3 May 2018. Added by: Varsha Shivangi.

Nau mai haere mai ki te Ruma Marama

Shane, welcome to Ruma Marama. You have settled in really well in your new learning environment. You have become familiar with the routines of the room and have developed your whanaunatanga. At drop off times, you are happy to say goodbye to your Mummy and engage with your friends.

You enjoy solitary and the group plays. You have made your own friend circle and can join with everyone else as well. You take advantage of all the learning opportunities available for you together with bringing in your ideas.

You are developing your confidence in your communication skills with your peers and adults around you. You like to do things in your own way and at times some situations become challenging for you. I am looking forward to helping you find strategies to overcome it and I am sure you have a lot of fun along the way.

Mā mahi, ka ora. By work we prosper.






Story date: 28 Feb 2018. Added by: Waheeda Begum.

Appendix 2: Learning stories after the viewing of the immersive video:

Te kēmu koha/ the beading game

Kiani, you and Ahisma are best friends and love to do everything together. Today when it was time for the beading activity you directed Ahisma to the mat and made yourself comfortable beside her. You knew the rules around this activity as this is a popular activity in the preschool room and you have participated in it a couple of times as it is a planned activity especially for you. Your mum had shared this idea with us as you have a similar activity at home.

You chose some special beads and took your time to thread it. You were very clear in your mind of what colours and patterns you wanted to create. You continuously showed your work to me to get my approval and as soon as I praised you or gave you a feedback your smile would stretch from one side of your face to the other. Finally, you completed you beading and were very proud it.

You displayed a lot of patience and concentration while you tried to put the beads through to the thread. Your journey of learning to work with others still continues and I believe when you will participate in the wheelie day it will give you a different opportunity to work toward achieving your goal.

Kiani, mauria te pono (believe in yourself) and that will enable you keep growing and learning. Through your participation you were able to refine your hand-eye coordination and small motor skill which will, help you to further strengthen your pincer grip and writing skills. You also learnt about contextual rules of how to do threading to get the result of your planned a pattern.

You and your friends are looking forward to the wheelie day next month which is very fast approaching and I know that you are going to have a lot of fun sharing your biking skills with everyone.

Story date: 24 Aug 2018. Added by: Waheeda Begum.

The new hot glue gun station!

Kiani, your creativity and love for art is evident throughout your learning journey here in Ruma Marama, either it be your portfolio or in your daily practice. I had rearranged the art and craft area and added a hot glue gun station to add a little more complexity and fun element to your creativity and learning.

You were very excited to use the wide variety of open-ended resources that were available for you. There is a 'one person at a time' rule for the hot glue gun station due to the space and location of the table. You waited for your turn and was very keen for Ahisma to have a turn after you. I explained to you that there were children waiting for a turn before her. Though you were not very convinced with my reasons but decided to abide by it as you just couldn't wait for a turn for yourself.

Kiani, you were so proud of your finished creativity. You insisted that I take a photo of your art work as you I had informed you earlier that I will be writing a story about your creative innovation. You showed great perseverance while using the hot glue gun and at the same time you were very careful and kept yourself safe.

You made your own choices with the resources and took your time to achieve your desired plan. We have been working together with your mummy to support and help you enhance your hand-eye coordination and this was one more activity where you lead your own learning through constructing something special for yourself.

You recognized and appreciated your own ability to learn with a pride which enables you to be the of te rangatiratanga of your own learning and which also links with the New Zealand school curriculum competencies. (Te Whaariki, 2017). I am looking forward to many more learning opportunities like this where you take charge and make me proud. Your love for outdoor is also very evident in the preschool room so maybe you could show me some tricks on the new outdoor resources next time as your mum is looking forward to seeing how good you are at adopting strategies when it comes to change, Should we try this?





Learning tags:

Ahisma plays bonjolele...

Ahisma, this is a planned activity for you followed by last months story. In your previous story, I mentioned that I will provide you with new musical instruments to experience. This morning as you were sitting with your friends by the musical instrument shelf, I provided you with bonjolele. You looked very confident and gave a go. You had hands on experience with this new musical instrument and you were able learn how it works yourself. Te Whariki (MOE 2017) states that an understanding that trying things out, exploring, playing with ideas and materials and collaborating with others are important and valued ways of learning. Using your thumb, you started strumming to make music and you realised that it was working. This gave you the confidence to sing. Through this, you also learnt how to tighten and loosen the strings using tuning pegs. Through this activity you are developing your whanau aspiration of feeling a sense of belonging in the preschool room. By attempting to play bonjolele, you are also recognising and appreciating your own ability to play.

What next.

Ahisma, you have a great interest and I am very glad because this will help us during the BestStart cultural festival. I would like to discuss about your interest with your parents which will help me support you further. Together we can research about music using our Ipad. Looking forward to supporting you with your learning journey Ahisma.

Varsha June /July

Azalea creates dinosaur enclosure...

Azalea, great to see you continue with your interests. Your previous story was about collage activity with your friends. I have also mentioned in your last story that you show huge interest in construction. I watched you as you build an enclosure for the dinosaurs. Our natural resources and the loose part area is the pride of our room. Our tamariki enjoy these resources to create wonderful things.

I could tell that you had a plan in your mind and you carefully picked up each piece to make your creation. You have put in a lot of thought and determination during this activity. You were also interacting with Vishaan and Yogeshwaar as you guided them where to place the pieces.

Azalea, you worked slowly and carefully to be successful at creating your design. This helps build your ability to focus and maintain attention for longer periods of time and teaches the important skill of patience. Through this activity, you are developing your skills to further develop your whanau aspiration. Azalea, you were able to express your feelings and ideas with others. Te Whariki explains that children use language to express feelings and attitudes, negotiate, create and retell stories, communicate information and solve problems. (MOE, 2017)

Where to next

Azalea, it is good to see you play with other children as well. You are developing your confidence in the preschool room. I will continue to provide you with more opportunities in construction and watch you grow and develop your interest. Our new programme planning is construction and we will introduce new ideas to this topic.

Learning tags:

Active exploration, thinking and reasoning | Communication with others | Problem-solving

Story date: 31 Aug 2018. Added by: Varsha Shivangi.

Love for music....Ahisma

Ahisma, I have been observing for the last couple of weeks and noticed that you really enjoy music and dancing. Whenever we have music on the TV or on the Ipad, you join in. This is your first learning story in the preschool room Ahisma, and I am very excited to document your learning journey. You and Kiani are really good friends which is giving you the confidence to explore different areas in the preschool room. You have smooth drop-offs and you venture off as soon your parent leaves. This is great as it contributes to your whanau aspiration which is developing your sense of belonging and connection in the preschool room. You are beginning to understand how things work and adapt the change in the preschool room. You have the ability to interact with your peers and your teachers. Ahisma, I can see that you know that you have a place in the preschool room which allows you to recognize and appreciate your own ability to learn. Te Whariki states that feeling that children belong contributes to their wellbeing and gives them the confidence to try new experiences.

What next for Ahisma

Ahisma, by engaging in these experiences, you have worked towards your whanau aspirations of being able to feel a sense of belonging in the preschool room.

Ahisma, I will continue to support you by providing you with more learning opportunities in our environment such as bringing in more resources that would encourage you to understand how things work like sing-a-long books and introducing a variety of music and musical instruments. I can't wait to see what else you would take an interest in.

Learning tags:

Active exploration, thinking and reasoning | Transitions

Story date: 14 May 2018. Added by: Varsha Shivangi.

Yogeshwaar....the explorer.

Yogeshwaar, this is your first learning story in the preschool room. I am looking forward to documenting your learning journey in ruma Marama. I have been observing you for the last couple of weeks and noticed that you enjoy solitary play very much. You are also trying really hard to make new friends. I often discuss with your dad the progress you are making in this room. You dad also informed me that at times you are reserved because when you went for your holidays in India, you had adults around you most of the time. When you started in ruma Marama, you didn't feel comfortable interacting with others around you. I was little bit concerned but recently I have been noticing that you getting involved in group discussions and group activities.

I was very impressed with you the other day Yogeshwaar when you said " Yogi do it". Pointing to the activity on the table. You are also getting to know the names of other children in the preschool room. The other day I was asking the children who made the mess on the floor and you replied "Darsh did it". You dad also informed me that you sing songs at home yogeshwaar. Well done.

I managed to capture this short video of you Yogeshwaar, interacting with Jai- Relly. This was so beautiful and I am glad that I had the opportunity to witness this moment. This video is a great example for you developing your whanau aspiration of feeling the sense of belonging and connection in the preschool room. You are developing your confidence with others around you. Your drop offs are getting much better which shows that you are now feeling belonging (Mana whenua) in the preschool room.

What next for you.

It is great to see you settling in very well in the preschool room Yogeshwaar. I feel that you need little bit more time to build that trust and confidence in your new environment to achieve your goal. I have also noticed that you show interest in all the activities we provide for our tamariki. Your favourites are trains and dinosaurs. Looking forward to supporting your whanau aspiration and interests. I am also looking forward to getting to know you whanau so together we can make your learning journey fun.

Tirohia ahau ki te takaro/Watch me play

Shane, today I watched as you and Yajat played. We had a lot of rain over the past few days and there was a lot of puddles around. I watched as yourself and Yagat talked to each other, laughed and stomped in the puddles. You scooped the water from one puddle to another, and you communicated with each other when you both had different ideas of what to do.

He aha te ako e tupu ana i konei?/What learning is happening here?

Shane, you are showing me that your are enjoying the outside area of the preschool. The rain that created puddles for you is of great interest here. You and Yagat have been able to spend some time together today, communicating about what you want to do with the puddles, stomp in them, scoop the water out. This spontaneous play has shown me that you are progressing well with your aspiration goal of becoming a strong communicator.

Hea ki muri?/Where to next?

Shane you are communicating well with your peers. You can articulate your needs and ideas to them. Last month we spoke about creating more group activities for your. I would like to continue along the path which will give you the skills to communicate with your peers in a group level, not only with a 1 on 1 level.

Learning tags:

Active exploration, thinking and reasoning | Be School Ready | Belonging | Communication with others | Creativity and expressive | Hinengaro (Thoughts and feelings). | Holistic Development | Whānaungatanga (Inter-generational concept - Relationships).

Story date: 1 Jun 2018. Added by: Kathy Stiles.

Appendix 3: Ethical approval:

FEDU132/16 **Approved : 24 November, 2016**

Ethics Research Application

THE UNIVERSITY OF WAIKATO
Te Whare Wānanga o Waikato

The Pedagogical potential of Virtual Reality: New Digital Educational Reality

Rene Novak

Faculty of Education

Overview

Principal Supervisor

Dr Michael A. Peters

Research Team

Dr E. Jayne White

Additional Personnel

The research will involve children and teachers from a selected Early Childhood Service.

Interest in Topic

This thesis further expands my interest in the importance of Creativity and Play that enable effective learning in the curriculum, discussed in my Masters dissertation (Novak, 2014). Play and Creativity are notions that have been hard to determine with traditional methods due to their intangibility (Rogers, 2011) and have hence caused some controversies in play based curriculums such as Te Whāriki - the NZ ECE curriculum. As play is hard to conceptualise it is also difficult to assess for its effectiveness to provide learning outcomes through, especially through the lens of standardisation and this is why some neo-liberal agencies are set to impose adult values (White, et al. 2007) into a curriculum that would lose its integrity (Stover & others, 2013). To address this deficiency, I would like to investigate the potential of developing new methodologies derived from Virtual Reality technologies to investigate these enable teachers to re-conceptualise children's creativity through play in the curriculum. I will create an immersive experience for teachers that will provide an opportunity to make the intangible more tangible. I have always had a strong interest in emerging new technologies and their influences and possibilities for Educational Pedagogies; specifically, I have been using visual methodologies in my work as an ECE-based Professional Services Manager in using video observations

as a tool to mentor Provisional Certified Teachers for observation, assessment, self-assessment, evaluation and professional development purposes.

Details of the Project

Research question(s) and relevance

How do immersive experiences with virtual reality enable teachers to re-conceptualise children's creativity through play in the curriculum?

Justification

The purpose of this study is set out to examine how virtual reality technologies can enable teachers to change their perceptions and conceptions about creativity through play in the New Zealand ECE curriculum. I wish to investigate some of the unique conceptions of Virtual Reality technology and if any of them offer a yet undiscovered pedagogical methodology that could potentially illuminate the intangible of the Educational process by raising the beholder to a new vantage point that could offer never before experienced clarity which other visual methodologies could not. The study therefore aims to provide an alternative view point that will thrust the teacher out of the one dimensional realm of evenness, order and sameness and immerse them into three and four dimensional sensations, empirical impressions and indulge them into a susceptible awareness of the intangible and unseen aspects of creativity through immersion in children's play. This will be achieved with the use of Immersive Visual Methodologies that will create new insights and potential pedagogical opportunities for learning in the early years. Whilst I am not arguing that Virtual reality technologies simulate reality to its perfection I believe that VR constitutes the latest evolutional stage in the western pictorial tradition of perspectivism, to which computational virtuality adds two advantages: that the image contains infinite points of view and that it can be manipulated (Pujol-Tost, 2011), thus also opening up immense possibilities for teacher training and education.

Procedure for recruiting participants

Based on the following six criteria I will identify and invite one high quality ECE service in my own organisation – Best Start - to take part in this study:
i) Very well placed cater for positive outcomes for children in their las ERO report (4 year return),
ii) Internal determinant grading of quality education and care review of quality teaching (must be 3.5 out of 4 or higher),
iii) receiptors of the internal TrustMark quality award for Quality Teaching,
iv) a mixed age centre,
v) all registered teachers in the setting express interest in taking part,
vi) geographical proximity to the Tauranga Campus of the University of Waikato,
vii) Centre is not going to be directly reporting to the researcher.

The invitation with the detailed outline of the research will be emailed to the centre leaders who will be invited to approach ECE staff in the first instance before replying

with interest.

Once selected, the centre leaders will be invited to approach all other adults in the setting including parent/s and give them the Participant Information sheet and consent form. Care will be taken to stress the voluntary nature of participation. The centre leader will then inform the researcher of any children or teachers who are not to be part of the study. If a parent has not consented to their child being involved in the study and it could not be avoided to have their child in the data, any video with them in it will be eliminated from the data set.
Additionally, children will have the opportunity to assent from their involvement by indicating discomfort with any aspect of the process. This will be carefully monitored by the researcher in consultation with both the teachers and parents throughout field work. In such cases, recording will cease on that day. In the case of any participants withdrawing, all video and interview data identifying them will be immediately eliminated from the study prior to analysis.
ECE staff will be informed of the potential study by information sheets and consent forms distributed via the ECE setting.

Procedures in which research participants will be involved

A.) The first part of the study is going to involve children and teachers being recorded by a 360-degree camera involved in free play in day to day interactions.
i.) The 360-degree camera is going to be placed in the environment one week before the recordings will start for the children and teachers to get used to it being there.
ii.) Across 3 days the 360- degree camera will generate footage based on everyday activities, routines and experiences within a play based curriculum. Children and teachers (and parents if on the premises) of the centre are going to be involved in this part of the study, who have gone through a thorough consent process to being videoed and informed on how this footage is going to be used.
- Parent's will be consenting to their children and themselves (if they are at the centre in the time of the recording) being videoed and observed.
- Consenting to the sharing of enrolment and assessment documentation concerning their Child/children.

B.) The second part of the study is going to focus on teacher's viewing and their perception of the 360 recording through a Virtual Reality device.
i.) Teachers are individually going to view a short (up to 15 minutes) edited 360 video with the use of a VR headset during their non-contact time over a period of one hour per teacher. Their responses while watching are going to be recorded with a video camera. Prior consent for a video observation is going to be sought.
ii.) After the viewing teachers will be individually interviewed by the researcher (see Appendix C for interview schedule). The interview is going to be video recorded. The viewing and the interview are going to take approximately 30 minutes per teacher. Prior consent for the interview is going to be sought.
C.) A third component of the study will include a 'before' and 'after' document

analysis comparing teacher's assessment and planning documentation of play immediately prior to and one month after the experience with VR to capture if and how teachers re-conceptualised the perception of creativity through play.

1. TIME:
i.) Registered Teachers:
- Part A: No additional time required
- Part B: 15 minutes for viewing the 360 video footage and 15 minutes for the interview following after.
- 10 minutes of time to discuss the project and grant consent
ii.) Parents:
- 10 minutes of time to discuss the project and grant consent
iii.) Centre Manager:
- 10 minutes of time to discuss the project and grant consent
- 5 hours to distribute consent forms to teachers and parents, collate them and relay them to the researcher

Please collate all supporting documentation such as questionnaires, interview schedules, observation processes, collection of work samples etc. into a single PDF and upload here

File Attachment : interview questions (pdf)

Procedures for handling information and materials produced in the course of the research. (Must be kept for five years)

All data (including video, observation, scanned documents and interview transcripts/audio) will be uploaded to google drive which is a password protected site that can be shared with supervisors for analysis.
A second copy of all data will be stored on a password protected shared file on a computer in the UoW Video Lab, Tauranga. Following the completion of the project the data will be deleted from the shared google drive space but will in the shared file at the University for a 5-year period. Hard copy consent sheets and observation category sheets will be stored securely in a locked cupboard in the Video Lab at University of Waikato, Tauranga. Hard copy consent sheets and data sheets will be securely destroyed on completion of the project and any publication arising from this, and for a maximum of 5 years. Selected video excerpts will be used for an article in VJEP, which are going to be fully downloadable due to its open access framework.

Ethical Issues

Access to participants

Permission to approach staff and families in the centre will be gained from the centre management first. Written consent will be distributed to the leadership, parents and teachers of the selected ECE centre. Consent for children will be sought by proxy from their parents/family.
The systems and procedures of the BestStart centres are well known to the lead researcher and it is the culture of these centres that they invite research to be done at their centres. As such no further approaches need to be made until ethical approval has been given by this committee.

Informed consent

Introductory letters and consent forms provide details of consent processes for all parties. Informed written consent will be gained from all participants. In particular, participants will be informed of the fact that the nature of the 360-degree video data involved means that neither anonymity or confidentiality can be assured in any publication or presentation arising from the study. Additionally, children will have the opportunity to assent from their involvement by indicating discomfort with any aspect of the process. This will be carefully monitored by the researcher in consultation with both the teachers and parents throughout field work. In such cases, recording will cease on that day. In the case of any participants withdrawing, all video and interview data identifying them will be immediately eliminated from the study prior to analysis.

Please attach copies of any introductory letters, information sheets and consent forms, and make reference to them here.

File Attachment : Letters for ethics (docx)

Anonymity/ Confidentiality

As explained above, due to the visual nature of data generated, neither anonymity or confidentiality can be guaranteed in this study. Participants will be given the opportunity to nominate a pseudonym for themselves or their child. The centre will be named and identifying features will make anonymity impossible to ensure in the reporting of video data. Observational data allows for anonymity by the use of codes.

Potential harm to participants

There could be potential power issues if the centre would directly report to the lead researcher who works as a professional services manager for the company. This will be averted by none of the centres directly reporting to the lead researcher being considered for the study. As the lead researcher is in a managerial position, even if the centre is not directly reporting to the researcher a minimalised power issue still persists. This will be further diminished by the voluntary participation to the study being anonymous and self-selecting, therefore if any centre does not want to participate in the study they will be able to state this anonymously causing that the centre will not be considered for the research. In such cases it will be possible to select another centre.
Similar power issues could be asserted for families who are invited to participate. It is hoped that this issue will be ameliorated by the fact that families (and teachers) will be approached by ECE service leader rather than the lead researcher.
In the event of a teacher disclosing personal details concerning the focus child's development during the course of an interview that have not been discussed with the family, the researcher will invite the teacher to share this information with the family prior to analysis of results. If this information cannot be shared by then, it will be eliminated from the data set.

Participants' right to decline to participate and right to withdraw/withdraw data

This has been explained in the participant letters and consent forms. Participants can withdraw from the study at any point until analysis begins. Please note that participants will not be approving transcripts or analysis in this study as not all interviews will be transcribed verbatim, and analysis will be completed in multiple ways.

Arrangements for participants to receive information

Participants will be given the opportunity to have access to the thesis and any publications that may arise as a result of this project. They can do so by contacting the lead researcher. Upon request, the lead researcher will provide an oral report of the study to the participating ECE settings every 6 months of the study and make himself available to keep it informed throughout the research process in between if additional questions arise. I will also add to the centre StoryPark newsletter page the digital link to the thesis in the research commons once completed.

Use of the information

The data will be used to draw conclusions in a Doctoral thesis. At the completion of the thesis, it is possible that some papers will be submitted to academic journals (including Video Journal of Education and Pedagogy) and in presentations on forums such as conferences and symposiums.

Conflicts of interest

As discussed under the 'Potential harm to participants' heading, the lead researcher will ensure that there is no potential conflict in terms of power issues.

There are no other potential conflicts of interest in this study known to the researcher.

Procedure for resolution of disputes

The process for participants will be outlined fully in the information sheets to participants. If there are going to be any concerns with the research teachers, parents or centre leaders are able to contact the lead researcher. If the dispute is not addressed in a satisfactory manner the complainants can contacts the researcher's Chief Supervisor, who will then address the issue. The contact detail will be available on the information sheet.

Other ethical concerns relevant to the research

N/A

Cultural and Social considerations

The lead researcher will operate within the cultural and social considerations of the ECE centre in discussion with the centre leader.
As all NZ ECE services operate within the parameters of a bicultural curriculum and share a commitment to Te Tiriti o Waitangi it is important that this study supports principles of family and community; holistic development; relationships; and empowerment. In the context of this study this means that the researcher will take special care to ensure that all children, families and teachers are treated with respect at all phases of the research process. More specifically where participants are Tangata Whenua the researcher will consult with local iwi groups to ensure that all protocols are considered, at all phases of the project.
The researcher has some strong relationships with the Ngati Te Roro o te Rangi Iwi in the region who he has been working with on a number of projects. BestStart has also its own cultural advisor that can also support the process.

Legal Issues

Copyright

The researcher will hold copyright for any scholarly publications produced from the research concerning data.

Ownership of data or materials produced

The participants will own the raw data. The researcher will own the analysed video, interview and observation data, as well as any scholarly publications and/or presentations that arise from it.

Any other legal issue relevant to the research

N/A

Place in which the research will be conducted

A BestStart CNI centre that has not yet been selected.

Has this application in whole or part previously been declined or approved by another ethics committee?

N/A.

For research to be undertaken at other facilities under the control of another ethics committee, has an application also been made to that committee?

N/A.

Is any of this work being used in a thesis/dissertation to be submitted for a degree at the University of Waikato*

Yes. The information to the participants, will state that an electronic copy of the thesis will become widely available, as the University of Waikato requires that a digital copy of a Doctoral theses be lodged permanently in the University's digital repository: Research Commons.

Further conditions

N/A.

Research Timetable

Proposed date of commencement of data collection:

5 June, 2017

Expected date of completion of data collection:

29 September, 2017

Informing Relevant Departmental Chair/s

Is your proposed research about papers or programmes within the University of Waikato Faculty of Education?

No

If yes, have you informed the relevant Head of School?

N/A

Applicant Agreement

Please include a signed PDF containing your supervisor's signature

File Attachment : signature (pdf)

Approval Date: 24 November, 2016
Chair: Carl Mika

Appendix 4: Interview Questions:

Guiding questions for interviews with the teachers:

Phase one: Initial attitudes towards play (Questions asked before the viewing)

BE1: Free Play

a. What are your current beliefs about free-play? How do you currently see play (physically and subjectively)?
b. What value do you see for free play? What are its functions?

BE2: Teacher role in play

a. How do you see your role as a teacher regarding play?
b. What are your beliefs in adult initiated play?
c. What is your view on rough and tumble play and war play (play with guns etc.)?

BE3: Space and time for play:

a. How much time do children get away from teacher's gaze in a day?
b. How much child guided free play is there in contrast to adult guided experiences for children at your centre?
c. How much attention do teachers give to sufficient and quality space catering for free play?
d. Have you done a specific review around time and space for play, if so when?

BE4: Play in the Curriculum

a. Do you set specific goals for children? Are they academic or dispositional? How do you relate the achievement of these goals with play?
b. How do you feel that the updated curriculum is catering for free play in comparison with the 1996 version?
c. What expectations does the current curriculum hold for you in terms of play?

BE5: Stakeholders affecting play

a. How strong are the expectations of your leaders (HT, CM, PSM) regarding setting and assessing specific outcomes through play? How many of these goals are academic?
b. How strong are the academic expectations of you parents for example for literacy and mathematics content and do they see a value in free play?
c. How strong is the perception for your children to need to become school ready? What are the expectations of schools for your children?
d. What is your perception of ERO expectations for goal setting for children and what they expect for the provision of free play?

LS1: Evaluate Learning Stories about play before the experience

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Phase two: Viewing the immersive video in VR

Lunch

Phase three: Any new attitudes developed (Questions asked after the viewing)

AF1: Free Play

a. Has the VR experience enabled you to change any of your beliefs about free-play through a feeling of presence? Elaborate. Did you get any strong emotional responses while observing children at play in VR?
b. Is there something about free play that you would put more value on now, or perhaps less? In what ways did VR enable you to see play?

AF2: Teacher role in play

a. Has the VR experience enabled you to change any of your beliefs about the role of a teacher regarding play? How was this experience different from watching a video, what did you see in VR that you would not see on video regarding play?
b. Have you changed any of your opinions about adult-initiated play? Was there anything in VR that you felt restricted you from learning more or interacting with the environment?
c. How did you feel while observing the children at rough and tumble play? Has your view on rough and tumble play and war play changed at all? Did you feel uneasy or disturbed by anything you have seen?

AF3: Space and time for play:

a. In the VR experience did you notice how much time children get away from teacher's gazes? Is it different from what you thought before how? Would that answer be different if experiences were perceived in real-life rather than in VR?
b. Has your opinion changed about how much child guided free play there should be in contrast with adult guided experiences for children at your centre?
c. Did you feel free to explore the VR space you were in or did something restrict you from developing an understanding about how quality space catering for free play should look like? Did you change your mind about it at all?
d. Do you think there is a need for a review of your play space now? If so what specifically changed your mind.

AF4: Play in the Curriculum

a. What did this experience tell you about children's goals set by adults in relation to play? Would you change anything about the practice and if so what?
b. Has your perception of the 2017 and 1996 versions of *Te Whāriki* documents views on play changed based on what you have experienced in VR? Which one do you prefer regarding their views on play and why?
c. Are there any implications from the experience you had on how you would use the current *Te* Whāriki differently?

AF5: Stakeholders affecting play

a. Based on what you have experienced would there be any changes you would propose to the expectations of your leaders (HT, CM, PSM) regarding setting and assessing specific outcomes through play? Would re-watching (revisit) the experience in your opinion support this in any way?
b. Based on what you have experienced would there be anything you would change in your practice with parent's expectations for learning? Any specific suggestions you would give to them regarding play?
c. Has your perception for a need for school readiness changed at all based on your VR experiences? If so in what way? Would you change any of the expectations for your children and is there anything you would like to talk to the schools about as a result of this experience?
d. Based on what you have experienced would there be any changes you would propose to ERO if you could regarding their expectations for goal setting for children and what they expect for the provision of free play?

LS2: Evaluate Learning Stories about play after the experience

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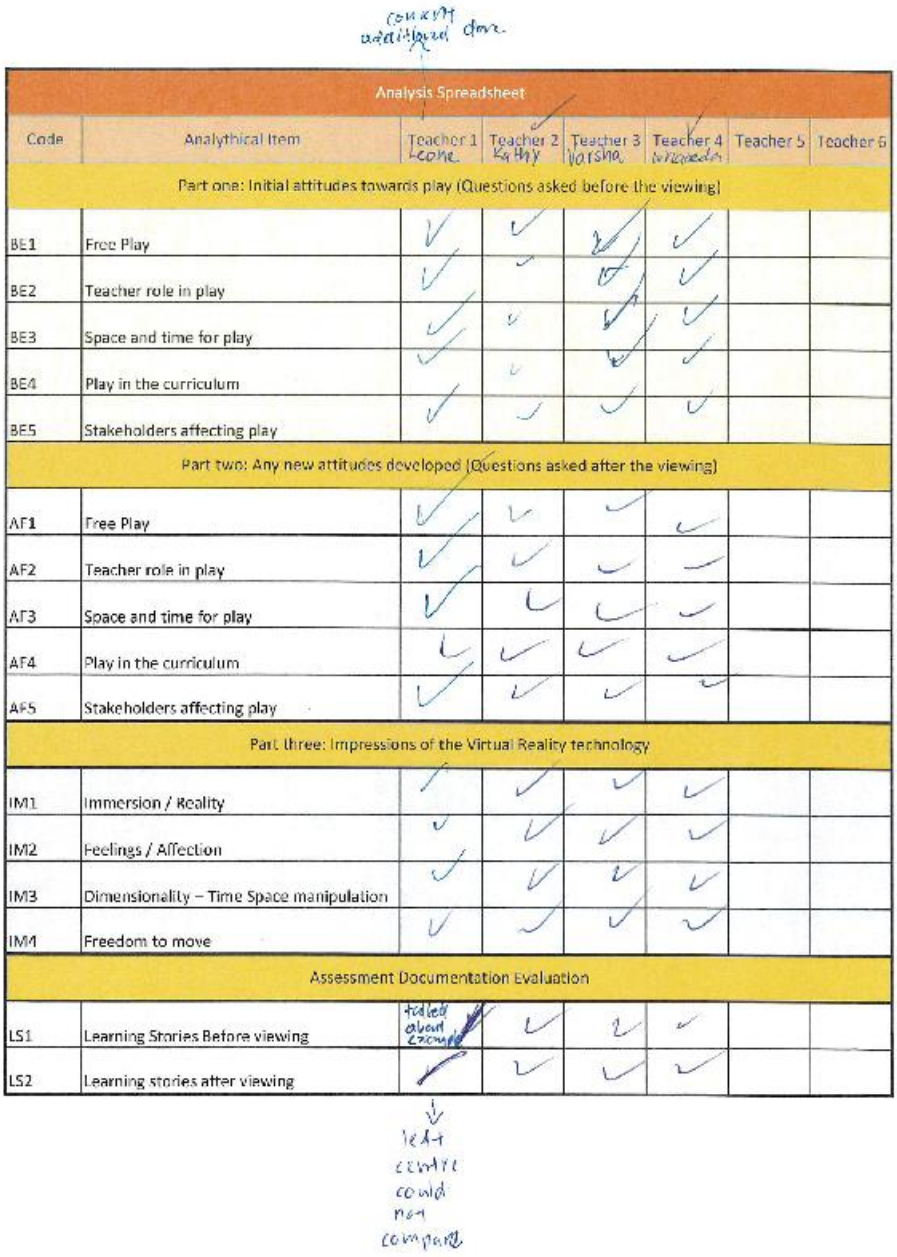
Appendix 5: Analytical sheet:



Analysis Spreadsheet							
Code	Analytical Item	Teacher 1 Leone	Teacher 2 Kathy	Teacher 3 Varsha	Teacher 4 Miranda	Teacher 5	Teacher 6
Part one: Initial attitudes towards play (Questions asked before the viewing)							
BE1	Free Play						
BE2	Teacher role in play						
BE3	Space and time for play						
BE4	Play in the curriculum						
BE5	Stakeholders affecting play						
Part two: Any new attitudes developed (Questions asked after the viewing)							
AF1	Free Play						
AF2	Teacher role in play						
AF3	Space and time for play						
AF4	Play in the curriculum						
AF5	Stakeholders affecting play						
Part three: Impressions of the Virtual Reality technology							
IM1	Immersion / Reality						
IM2	Feelings / Affection						
IM3	Dimensionality – Time Space manipulation						
IM4	Freedom to move						
Assessment Documentation Evaluation							
LS1	Learning Stories Before viewing						
LS2	Learning stories after viewing						

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vii. Literature

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