Learning Through Play

By: Steffenie Williams

A dissertation submitted in partial fulfillment of
the requirements for the degree of

Doctor of Philosophy
(Curriculum & Instruction)

at the
UNIVERSITY OF WISCONSIN - MADISON
2024

Date of final oral examination: 5/8/2024

The dissertation is approved by the following members of the Final Oral Committee:

Mary Louise Gomez, Professor, Curriculum and Instruction
Dawnene Hassett, Professor, Curriculum and Instruction
Peter Wardrip, Professor, Curriculum and Instruction
Peter Miller, Professor, Educational Leadership and Policy Analysis

Abstract

Play is an important dimension of learning for all students. When students are allowed to play, amazing things happen. Students start to tell stories, explore new concepts, and learn in authentic ways. Some of these experiences are constructed with peers, while others are created individually. Discoveries are made by connecting one student's ideas with another and this new knowledge or idea is then shared with classmates. Play is a tool for student learning, discovery, and understanding. It's where they discover ideas, experiences, and concepts, and where they can analyze these discoveries and their consequences. When students explore ideas generated through play with student-led interest projects, they take agency in their own learning. Play and play-based learning allow all students access to innovative and creative educational experiences. In this study, students' stories and experiences with play are analyzed and shared using narrative inquiry and autoethnography.

Dedicated to my beautiful & entertaining family.
Without your enthusiastic support
of my wild ideas, free spirit, & chaos,
None of this would have been possible.
:)

Acknowledgements

Thank you to Professors Dr. Mary Louise Gomez, and Dr. Dawnene Hassett for guiding me through graduate school, reading every single word of this dissertation, and for lovingly accepting the diversity of my endeavors as a teacher, artist, community champion, environmentalist, academic, and family member. Thank you to my committee members, Dr. Dawnene Hassett, Dr. Mary Louise Gomez, Dr. Peter Wardrip, and Dr. Pete Miller.

Special thanks to Dr. Rich Halverson, Aaron Birdbear, Art Rainwater, Mary Klehr, Shari Smith, and Ben Rodriguez. Dr. Rich Halverson for tolerating and supporting all of my ideas – one of which led to a Fulbright! Aaron Birdbear for supporting me without judgment. Art rainwater for being a storyteller extraordinaire. Mary Klehr for friendship and happy-grams. Shari Smith for being amazing - finding an answer for every question including coursework, strong-arming professors and the graduate school to do what's right, for bringing my students shark teeth from the beach, and being a friend and mentor throughout my graduate school years. Thanks are not enough for Emeritus Associate Dean Ben Rodriguez. Without Ben, I would not have begun my educational journey at the University of Wisconsin – Madison as part of the Academic Advancement Program. Ben represented and created a community for learners and advocated for equitable education. Ben continues to be my champion, defender, garden buddy, Squishy's Grandpa, and friend.

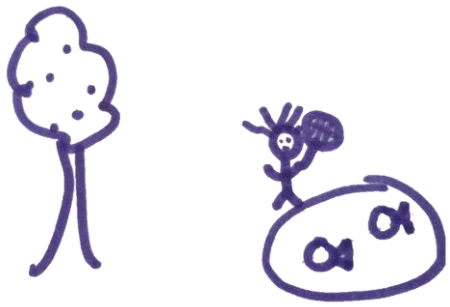
Thank you to Sister Kathleen and (Monsignor) Father Tom for giving me my first opportunity to teach in a community of kindness and for leading with love. My Fairy Godfather, Marf, (Dr. Marvin Birnbaum) thank you for encouraging me to teach Think First Injury Prevention to children in our community and being a staunch supporter of all my efforts. Thank you to Dianne Lahey for teaching me how to teach tiny humans at the pool and being the best bonus big sister.

The BIGGEST thank you goes to my amazing cheerleaders: My Mom - Andrea, Uncle Steve, Brother – Josh, Mema, Papa, Dotte, Uncle Mike, Dad, Second Mother – Apu, and Yogi; Besties: Patty, Emily, Steph, Linda, & the Jills; and my favorite distractions: Teddy, Squishy, Tootie, Tallulah, Frankie, Paulie, Pepe, Sputnik, Luigi, and the Tortilla; and editors Tallulah Williams and Yogi Ramakrishnan.

I wouldn't be here without ALL OF YOU (and many, many more). THANK YOU.

Table of Contents

Chapter 1: Context



(Illustration of a student exploring and discovering on a field trip at a pond)

Introduction

Play is an important dimension of learning for all students. When students are allowed to play, amazing things happen. Students start to tell stories, explore new concepts, and learn in authentic ways. Some of these experiences are constructed with peers, while others are created individually. Discoveries are made by connecting one student's ideas with another, and this new knowledge or idea is then shared with classmates. Unstructured play, also called free play, is a category of play where children engage in open-ended play with no specific learning objectives. This kind of play is an important piece of the learning puzzle for all students. In this study, I explore the research surrounding the importance of unstructured play as a tool for student learning, discovery and understanding.

Play in general is defined as "engaging in activity for enjoyment and recreation rather than a serious or practical purpose" (McKean, 2005). Yet early childhood educator and play researcher Vivian Paley (2009) states that:

> Play is the serious and necessary occupation of children; it's not just a pleasant hobby or a frivolous means of spending nonworking hours. Freud considered our life-force as made up of work and love in equal measure. For a child, the formula would better be stated as 'play and love equals life.' (p. 122)

Like Paley, Anne Haas Dyson (2009) sees play as more serious and necessary than an enjoyable form of recreation for children. Especially with such an emphasis on closing the gap and test scores, she feels that students are missing out on fundamental avenues for learning. Other scholars as well (e.g., Ashiabi, 2007; Van Oers & Duijkers, 2013; Weisberg, Hirsh-Pasek, & Golinkoff, 2013) have noted that the increased focus on academic standards with more teacher-directed instruction have decreased the amount of play time in early elementary schools. Teaching students in a way that forces information into their developing minds overwhelms children's cognitive abilities, and is ultimately counterproductive (Dyson, 2009).

Yet play is where children discover ideas, experiences and concepts, and where they can analyze these discoveries and their consequences. Dyson's and Paley's lifetimes of scholarship, along with others, has shown that learning really begins when children are able to play and imagine. School should be where students "experience play as intellectual inquiry" (Dyson, 2009, para. 7) and unstructured playtimes naturally engage kids intellectually. Students do not always learn by sitting in desks, and they cannot be intellectual by acting solely as receivers of information. As Dyson (2009) notes, students need 'stimulation.' "We have to give them a sense of their own agency,

their own capacity, and the ability to ask questions and solve problems… We have to give them more open-ended activities, the space they need to make sense of things" (Dyson, 2009, para. 8).

The type of play that Dyson describes above as "unstructured play" is also known in the research as "free play" (e.g., Bilewicz-Kuźnia, 2016; Holt, Lee, Millar, & Spence, 2015), and is described by Pyle & Danniels (2017) as "play that is child directed, voluntary, and flexible and often involves pretend play, although it can refer to other types of play as well" (p. 275), such as pretend role playing in conversation with adults (Lindqvist, 2001).

Researching play and the impact it has on student learning and understanding is important work as our schools continue to take play out of the school day. By looking at the impact of play on student learning, we may be able to encourage schools and districts to schedule times for unstructured play, discovery, and intellectual inquiry throughout each school day. To further understand the importance of unstructured play and its relationship to learning, I begin with a history of play and a discussion of modern play theory.

Study

The purpose of this narrative study is to understand the educational importance of unstructured play as a learning tool, and to describe the ways that play impacts student learning for elementary school students at Jamestown School in a mid-sized Midwestern city in the United States (all names of places, institutions, and people are

pseudonyms). At this stage in the research, unstructured play will generally be defined as students engaging in activities for enjoyment and recreation, rather than a serious or 'practical' purpose. This includes time for imagination, discovery and instances of cooperation or teamwork. By gathering individual student stories, experiences and discoveries made through unstructured imaginative play we can focus on how individuals or groups of students make sense of their world through unstructured play.

For my study, I am proposing a narrative study with a small classroom of second and third grade students (8 students total), where time for authentic play is designated into every school day. By analyzing observations, interviews and videos, the outcomes of this study could help to encourage unstructured play periods for all elementary aged students.

Research Questions

The central question for this study is: How do children in 2nd/3rd grade classrooms in a mid-sized city experience play during the school day?

Analytic questions for this study include:

- How does unstructured play, imagination, discovery learning and cooperative play impact student understanding and learning in schools?
- How does unstructured play affect the learning of these students?
- Does unstructured play encourage creative problem solving skills?
- Does unstructured play encourage exploration, interaction, cooperation and

problem-solving skills?

- Are there specific instances where play seems to impede learning?
- How do students feel about the periods of unstructured play & discovery learning?
- In what ways do students feel that unstructured times are valuable/important to their own learning?

These analytic questions guide my research by giving direction to the participant-observations and member checks I have conducted. They also provide rationale for the methods I used to collect data. I observed, participated in play, interviewed and member-checked (in creative, student-centered ways) to encourage students to share their stories as I created narratives of student experiences during play.

Study Significance

This narrative study is significant to educational research for several reasons. It contributes to a field that is almost non-existent. Studies regarding the importance of play and play-based learning in schools are usually derived from teacher-led activities/projects, rather than student-led and play-based education. This qualitative narrative study contributes to the understanding of students at play in schools and the social-emotional benefits that this kind of learning has on student learning. Much of the current literature on play and play-based learning talks about the general importance of play or how to use play within teacher-led lessons. Missing in the literature are the students themselves. By centering my study on students at play, I explore the ways in which learning is happening organically, without the interference of teachers or other

adults. There is a growing interest in play research around the world including countries where play and play-based learning is or is becoming a requirement (examples include New Zealand, Norway, Finland). Schools of play, where children are encouraged to play, explore the outdoors, and learn in natural ways, are also becoming more popular throughout the world - though many have been around for decades. I aim to contribute to literature on play, play-based learning, project-based learning (which is student-led) and narrative inquiry as I tell the stories of my students at play in school. This study also has the potential to influence educational policy around the importance of play and play-based learning in schools. My hope is that studying students at play during school times will bring attention to the ways in which students interact, build relationships, explore, experiment, and learn through play.

Children are made for play - it helps them learn, build relationships, work through problems, and explore ideas. Play policies in schools need to change. Students need ample time for unstructured play and recess. States, districts, administrators, teachers, and families should fight for the rights of their students to have these break times multiple times throughout the school day. Unstructured play should not just be a reward and should not be linked to student behavior or punitive practices. Play should be required for all students in elementary, middle, and high school.

As we consider each of these play-based ideas, theories, and schools, we need to think about why students in grades other than preschool and kindergarten are no longer allowed to play. If students learn through play, are able to work through concepts by playing, can concentrate more easily because of time devoted to play, and learn to build

cooperative relationships with peers using play, shouldn't play be an integral part of learning for all students in all grade levels? Through my research, I show the important role and impact of play on learning for students - focusing on students in 2nd/3rd grades specifically because this is when play is taken out of many aspects of education.

Chapter 2: Literature Review

(Illustration of a student creating digital art)

History of Play & Modern Play Theory

Children have been playing worldwide since the beginning of time. They seem designed to play. Through play, children evolved into beings that could, as Gray (2019) informs us, "practice skills that are essential to their survival and reproduction; learn to cope physically and emotionally with unexpected, potentially harmful events; generate new, sometimes useful creations; and reduce hostility and enable cooperation" (p. 84). Gray goes on to explain that the desire for children to play, and the value placed on play:

> Manifests itself most clearly in hunter-gatherer cultures. Anthropologists and other observers have regularly reported that children in such cultures play and explore freely, essentially from dawn to dusk, every day—even in their teen years—and by doing so they acquire the skills and attitudes required for successful adulthood. (p. 443)

Gray (2019) explains that as the world changed from a hunter-gatherer society into a more agrarian society, the opportunities for children to free play declined. In many post-hunter-gatherer societies, children spent much of their time each day working, such as doing domestic and farming tasks and, with the start of the industrial revolution, worked in factories. Children still played when they could, even when working. When they did play, they played freely without adult direction - meaning authentic, unstructured play. The contemporary educational concept of free play is that play is an activity outside of 'ordinary' life, that absorbs the player intensely and utterly while not being serious. Play is an activity connected with no material interest. It is an entity that proceeds within its own boundaries of time and space according to a fixed set of rules (Huizinga, 1955). This theory of play is commonplace among educational theorists.

Vygotsky's theory of cognitive development (1967; 1978/1995; 1981) is based on the idea that imaginative play and social interactions aid in the cognitive development of children. Social interactions that children engage in during play help them create meaning and support learning through discovery. Vygotsky also believed that social interactions that children engage in help them to discover and create meaning from the things that they discover. Some of the most important learning a child can experience

is in the social interactions they had with an adult or skilled tutor, including parents or teachers. Children observe behaviors exhibited by the tutor and try to emulate what they observe.

As children attempt to understand their observations, they copy and internalize these interactions, while learning to apply them to their own lives. Vygotsky (1967) called this interaction the collaborative or cooperative dialogue, which is thought to have been between children and adults but could also involve social interactions with other children. Vygotsky believed that children involved in imaginative play develop meaning and that this, in turn, helps children make sense of their worlds. When children are allowed time for imaginative play, they engage in role-playing activities, create stories, develop dialogues, and solve problems (even when engaged in play by themselves) - all skills needed for successful adulthood.

Play theorist Friedrich Fröebel (1826), believed that "play is the highest expression of human development in childhood for it alone is the free expression of what is in the child's soul" (p. 50-51). When children are given time to play, they construct understanding of the world by directly experiencing it. Prior to Fröebel's kindergarten, children under the age of 7 could not attend school. It was believed that young children did not have the ability to concentrate or develop cognitive and emotional skills before this age. Fröebel believed that early education was of the utmost importance and believed that “because learning begins when consciousness erupts, education must also” (p. 51).

His ideas about learning through nature and the importance of play, especially outdoor play, lead to students planting gardens at school; playing outdoors with peers; and learning through play, all while allowing children to be led by their own interests and encouraging them to freely explore their world. Teachers were seen as guides rather than experts. Fröebel thought that through engaging with the world, understanding unfolds. Hence the significance of play – it is both a creative activity and through it, children become aware of their place in the world.

John Dewey (1897; 1916), another theorist highlighting the importance of educational play, emphasized the concept of learning by doing and that children learn more deeply with a hands-on approach. He believed in authentic and meaningful ways for students to learn. Dewey (1916) argued that education can only truly be effective when children have learning opportunities that enable them to link current knowledge to prior experiences and knowledge. Within his framework, students were no longer viewed as passive recipients of knowledge. They played an active role in their education. Students were allowed to play with their education, choosing to learn content that was meaningful to them, and were encouraged to explore topics in depth that were relevant to their lives. Dewey promoted interdisciplinary education, where topics intersected with other areas of study allowing students the ability to play with their education.

Experiential learning theorist David Kolb (1975; 1976; 1981; 1984) developed an experiential learning theory based on learning styles. This includes a four-stage cycle of learning and four learning styles. He believed that, “learning is the process whereby

knowledge is created through the transformation of experience" (1984, p. 38). These experiences fall into four categories: the Concrete Experience, where a new experience or situation is encountered, or a previous experience is reinterpreted; Reflective Observation, where the experience is thought about and inconsistencies between the experience and understanding are explored; Abstract Conceptualization, where the person has reflected and learned from the experience; and Active Experimentation, where the learner implements the new idea.

Encouraging the learner to experience learning by playing with ideas, thinking about concepts, and applying those insights (Bransford et.al., 2000) could lead to better and more thorough understanding of those topics. Students may also dis

In today's classrooms, many of these play theories are put into action in a variety of ways. Social interactions between children are encouraged during choice times, recess, classroom discussions and during imaginative play times. These interactions help children discover and create meaning. By playing outdoors during school hours during recess, physical education, outdoor exploration/planting times and during field trips, children are able to construct understanding of the world by directly experiencing its wonders. When students are allowed time for imaginative free play, they construct knowledge based on their experiences. These experiences could lead to genuine interest in topics that students would not have had the opportunity to explore without creative, imaginative play times. For example, learning through a project-based approach allows students to take agency in their own learning, while exploring

meaningful and authentic topics. Topics could be linked interdisciplinarily to lead to in-depth learning in multiple subject areas.

Drawing on elements of play theory from Vygotsky, Fröebel, Dewey and Kolb, my research study has components of cognitive development, learning through nature, and learning by doing. The process of cognitive development through imaginative play (role-playing, storytelling, and the skills developed therein) was observed during play periods in school through recordings/notes on conversations students were engaging in, stories students told/created/acting out, and the ways they chose to work through disagreements during cooperative play. The ways that students became aware of how they fit into the world was observed during play times where students were allowed outside to interact with both their peers and the natural world. These times were mostly during recess, when students were able to play outdoors in the trees, dirt, garden, and grass. Learning by doing was observable during all times when students were engaged in play where they were discovering, learning a skill or teaching each other how to do something. These included learning individually, outdoors, indoors, cooperatively, and even through student-inquiry/project-based learning.

Play Styles in Learning

There are numerous styles of play used in educational settings. Some use teachers as leaders, others with teachers serving as guides and a few where students are in charge of their own learning and play. Common play styles in learning include play-based learning, project-based learning, student inquiry and unstructured/authentic

play. Play-based learning is an educational method that can be strictly structured with all materials and standards planned for, can be a more open-ended kind of learning where students are allowed to play more freely with teachers serving as guides or it can fall somewhere in between (King, 1982, 1986; Pyle & Daniels, 2017). Structured play and guided play can also fall into this category of play learning (Weisberg, Hirsh-Pasek, & Golinkoff, 2013). Teachers guide students through activities, education "stations," rhymes, songs, memory games, word puzzles, board games, guessing games, math games, and games involving imaginative journeys (Hyvonen, 2011) where play plays a large role in the learning process. Huizinga (1980) described this kind of learning as "educational play," where students are motivated by knowing and thinking logically. An example of this type of play is using verbal games with questions and answers. Student inquiry-based learning is a style of intellectual play where students can play with ideas, concepts, inquiries and interests. Students are authentically interested in topics and teachers guide students through investigations on these topics (Edelson, Gordin, & Pea, 1999; Panasan, & Nuangchalerm, 2010; Abdi, 2014). Students start by creating questions and developing problem statements. They research the topics while working to answer the questions constructed earlier. Teachers guide students through the research process. Artifacts and presentations are created and shared with the class. Students then reflect on the inquiry-based learning process. Inquiry- based learning is a teacher-directed way for students to play with theories and ideas they are authentically interested in learning about.

Unstructured play, authentic play and free play are defined as students engaging in activities for enjoyment and recreation, rather than a serious or "practical" purpose (Holt, Lee, Millar, & Spence, 2015). This can include imaginative play, discovery learning and opportunities for cooperative activities or teamwork (Dyson, 2009). This kind of play and learning is student driven, without interference or direction from teachers or instructors (unless safety or well-being becomes an issue). Student-driven play learning is beneficial for social emotional learning, skill building, creating relationships with peers, cognition, and discovering concepts through imaginative practices (Nicolopoulou, Barbosa de Sá, Ilgaz, & Brockmeyer, 2009; Paley, 2004; 2009a; 2009b).

Play Policies in Today's Schools

Current educational policies do not allow for play in many schools. Standardized assessments, "closing the gap," and standardized curriculum are policies that remove educational joy, replacing it with rote memorization and standardization. These policies do not have student well-being or happiness in mind, and are not best practices in education (Ramstetter, Murray, and Garner, 2010). This style of education is archaic, inappropriate, and inequitable. The joy of learning, playing with peers and learning by exploring and discovery are more beneficial to learning than standardization and summative assessments.

Unstructured play time is essential to student development, benefiting physical health, promoting creativity, improving cognitive faculties including focus and recall, and improving learning. A study of more than 200 elementary students in 2014 found

that “physical activity improved students’ fitness and brain function, enhancing their accuracy and reaction time in cognitive tasks” (Hillman et al, 2014, para. 22). Other studies show that children who have unstructured play times during the school day are more creative, have better problem-solving abilities, are less disruptive, and learn social skills including conflict resolution and cooperation.

In 2017, the Centers for Disease Control and Prevention (CDC) recommended at least 20 minutes of recess a day at the elementary school level, defining recess as “unstructured physical activity and play” (p. 7). These are times when students are allowed to explore, create, and build relationships without structure or teacher intervention. Unstructured play allows students a break from academics and structure.

The American Academy of Pediatrics (AAP) describes recess in a 2012 policy statement as a “necessary break in the day for optimizing a child’s social, emotional, physical, and cognitive development that should not be withheld for punitive or academic reasons” (p. 183). Physical education and physical fitness have benefits for students’ personal and academic performance. Recess has its own, unique benefits. Recess is an essential, planned break from rigorous cognitive tasks. Recess allows students a time to rest, play, imagine, think, move, and socialize. After recess or unstructured breaks, students are more attentive in class and can perform educational tasks more easily. Recess helps children develop social skills. including collaboration and cooperation, that are otherwise forgotten in structured educational environments.

Devaluing Play

Although the benefits of unstructured play times in school are clear, “44 percent of districts reported cutting time from one or more other subjects or activities at the elementary level, including science, social studies, art and music, physical education, lunch and recess” (McMurrer, 2007, p.3). These are times when children are allowed and encouraged to play. *Choices, Changes, and Challenges: Curriculum and Instruction in the NCLB Era* is a report from the Center on Educational Policy that finds decreases in the amount of instructional time given to these subjects average around 31 percent since 2001-2002.

“‘What gets tested gets taught.’ said Jack Jennings, CEP’s [Center on Educational Policy’s] president and CEO. Under No Child Left Behind, there is reading and math and then there is everything else. And because so much is riding on the reading and math included on state tests, many schools have cut back time on other important subject areas, which means that some students are not receiving a broad curriculum’” (McMurrer, 2007, p. 1-2). This report also finds that the increases in curriculum time and decreases in play times are more common in districts with so-called struggling schools.

“When you go back to the start of public schools and the drive to get kids educated 135 years ago, they all had recess,” said Robert Murray, a pediatrician who co-authored the American Academy of Pediatrics statement: ”In the ’90s, as we got more and more focused on the core courses and academic performance and test scores and all that, people began to look at recess as free time that could be taken away,” (Murray, 2007, p. 2). For example, in elementary reading classes, 84 percent of school districts

report changing their curriculum to emphasize tested content. In middle and high schools, 76-79 percent of districts altered curriculum to focus more on content that students would be tested on. "Similarly, 81 percent of districts reported changing their math curriculum at the elementary and middle school levels to more closely match the content of state tests, while 78 percent of districts reported doing so at the high school level" (McMurrer, 2007, p. 2).

"Some devalue recess because they assume it to be — as they assume play in young children to be — a waste of time, time that could be otherwise more efficiently spent," Anthony Pellegrini, former professor of educational psychology at the University of Minnesota, wrote in a 2008 paper. "There is no theory or empirical evidence to support this point of view. The counterargument, that recess is good, is backed by a large body of theory and empirical research" (Reilly, 2017, para. 11).

Allocation of Play

What's especially problematic is the disparity in how recess is allocated. Students who are African American, poor, or struggling academically are among those least likely to have recess or unstructured play at school (Link, 2019). This is because schools and students that fall into these categories are thought to need more time to prepare for standardized assessments – more academic time. Play is seen as "wasted time" for these schools and students (Pellegrini, 2008, p. 182). Research has found that 62% of school districts have increased the amount of time spent on English language arts or math in elementary schools, while 20% of school districts have reduced recess

time (Shape of the Nation, 2016). There have been no notable improvements in academic scores with this method of learning, however, there is substantial evidence that physical activity, including recess and free play times, can have a positive impact on cognitive skills, attitudes and academic behavior that help improve academic achievement, including grades and standardized test scores (CDC, 2010).

Despite the research on the benefits of play and recess during the school day, the CDC found that one-third of elementary school students do not receive any daily recess, free periods, or play times. Students are suffering because of the lack of play, free time and breaks at school. Teachers and administrators are seeing increases in behavioral problems, anxiety, and the inability to concentrate on the material being taught. Time once reserved for play is now dedicated to standardized education and test preparation.

Hope for Play

But there is hope for our students and the future of play. "At least five states now have a codified recess law, and seven more —Iowa, North Carolina, South Carolina, Louisiana, Texas, Connecticut, and Virginia—require at least 20-30 minutes of physical activity, though it is up to schools to decide how they wish to allocate that time" (Link, 2019, para. 5). These policies are being driven by research showing the benefits of unstructured play on student's cognitive development. A 2015 Stanford study of six low-income elementary schools found that recess and unstructured play can help students feel more engaged, safer, and positive about the school day (Parker, 2015). Other favorable student outcomes because of recess and unstructured play include

attendance; achievement; students' physical and emotional safety at school; positive relationships with peers and adults; support for learning; and an environment that fosters school connectedness and engagement (Parker, 2015).

In a 2010 report by the Centers for Disease Control and Prevention, the authors argue that positive associations between recess and academic performance were found. Open-ended, imaginative play opens students' minds, allowing for creative thought. "The research has shown that we need to… not cut back on recess, but keep kids active and moving around. Children's brains develop based on activities and connections, and their ability to focus is enhanced. Having breaks and being active is sort of like Miracle Grow for the brain," (Link, 2019, para. 6). Even the United Nations Office of the High Commissioner for Human Rights recognizes the "right of all children to play, regarding it as an essential part of their well-being, especially for the economically disadvantaged" (Parker, 2015, p. 8; OHCHR, 1990, Article 24).

As the research on the benefits of unstructured play and recess emerge, groups of advocates including parents, teachers, administrators, professional organizations, and advocacy groups are using this as leverage to encourage schools to protect recess times and dedicate times for unstructured play throughout the school day. Strong public support for recess in Arizona encouraged state legislators to enact a law requiring two recesses each day for the state's elementary school students. Since the law's passage, teachers have seen fewer disciplinary issues, improved test scores and benefits to students' overall health (Link, 2019).

Some of the benefits of recess and unstructured play are what you might expect. A 2009 study found that 8- and 9-year-old children who had at least one recess period each day (of more than 15 minutes) had better classroom behavior. Students were less fidgety and were able to focus on content after recess (Link, 2019). Recess and unstructured play times also allow for students to be creative, tell stories and cooperate. "Creativity in children involves the ability to make things up and generate ideas on their own," said Sandra Russ, a professor in the department of psychological sciences at Case Western Reserve University in Cleveland (Holson, 2019, para. 5). Playing with peers, storytelling and building with blocks or other toys that stimulate wonder and curiosity during free play are valuable ways for children to learn. Robert Bilder, a clinical neuropsychologist and a director of the Tennenbaum Center for the Biology of Creativity in Los Angeles, studies creativity and the brain. He believes that what is valuable for children is the freedom to play with ideas, where they can solve problems with no predictable answers. When problems are open-ended, he believes that students retain the curiosity to learn more things (Holder, 2019). By allowing unstructured play and recess throughout students' educational lives teachers can help students academically, socially and emotionally. Periods of play throughout each school day are necessary for behavior management, concentration, health, and these breaks in academic learning help to increase grades and test scores.

Schools of Play

Authentic play in today's schools is underutilized and, in many instances, only allowed during recess (if recess is mandated). As a result, play-based schools are becoming increasingly in demand.

One style of play curriculum is Anji Play. This style of learning was developed by Cheng Xueqin for students 3-6 years old in Anji County, Zhejiang Province, China. Anji Play is a curriculum where learning is based on self-initiated, self-determined play, reflection, and self-expression. Students can build with found materials including bricks, lumber, boards, rope and oil drums. They play, discover, problem solve and create collaboratively. These children then watch videos of their play and discuss their discoveries and intentions. They then create complex drawings, schematics and symbolic writing systems to show their important work and discoveries. Anji Play is about freedom and time. Students play for the majority of their school days. The longer students are allowed to play, the more complex their play scenarios become. "When children engage in True Play, they are realizing specific intentions. Most simply put, they intend to have fun. But when given the space, freedom, materials and importantly time, these play intentions manifest themselves in high degrees of complexity" (Xueqin, 2019, p.3).

The teacher's role in Anji Play is important - "they are not guides, they do not structure play towards specific goals, and they do not view children as unsophisticated thinkers that need to be directed towards achievement. Teachers in Anji observe and take part in play, but they do not intervene. They understand that children choose to

resolve their own conflicts, manage and regulate their own risk and develop rules and order to get the most fun out of their play. They trust children" (Anji Childhood Education Research Center, 2019, p. 4). "Anji Play is founded on deeply-rooted trust in our children. It is, at its core, a movement of love, risk, joy, engagement, and reflection. We owe it to our children, to ourselves, to our societies and to the world to embrace these core principles (Anji Childhood Education Research Center, 2019, p. 4)." Teachers and families participating in the Anji Play style of education understand that the most effective learning happens when the child owns their own experiences and discoveries. (Anji Childhood Education Research Center, 2019).

Forest Kindergartens or Waldkindergartens are another kind of outdoor play curriculum. These schools originated in Scandinavia and are being popularized in Germany where there are over 700 Waldkindergartens throughout the country. Students at these schools spend their days outdoors in all weather conditions and temperatures. Friedrich Fröbel, the German educator who opened the world's first kindergarten, or 'children's garden,' more than 150 years ago, thought that young children should play in nature, cordoned off from too many numbers and letters (Forest Kindergarten Association, 2018). Forest kindergartens are a throwback to Fröebel's original kindergartens where students learn outdoors in nature.

Forest Kindergartens are nature-based learning communities where trained outdoor practitioners guide learner-led exploration and discovery. Forest Kindergartens aim to develop self-awareness, self-regulation, fine and gross motor skills, intrinsic motivation, empathy, good social communication skills, independence, a positive

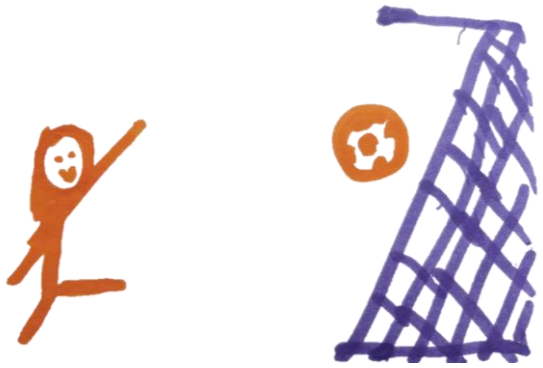
mental attitude, self-esteem, and confidence. The Forest Kindergarten environment is seen as a blank canvas, full of textures and materials to enrich the senses and stimulate the learning journeys that we will all undertake (Forest Kindergarten Association, 2018).

Montessori is another form of student-centered play schooling created by Italian physician Dr. Maria Montessori. This method, "fosters rigorous, self-motivated growth for children and adolescents in all areas of their development—cognitive, emotional, social, and physical" (American Montessori Society, 2021, para. 2). Montessori is student-led, with each student working at their own pace. Students choose topics of interest, with teachers guiding and leading through activities to foster learning. Students work individually or collaboratively on their projects/interests in multi-age classrooms (Montessori, 1964).

Montessori schools are focused on a child's "work" which should be joyful, natural and effortful and includes social emotional learning, cognition, and the mastery of concepts and skills (Cossentino, 2006). A large portion of children's work involves exploration, inquiry, discovery and play (Bruner, Jolly, & Sylva, 1976; Sutton-Smith, 1997). The Montessori method encourages children to repeat activities as many times as necessary to master skills. These cycles of repetitive learning are called "work cycles" (Montessori, 1964). As Cossentino explains, "The child's internal work cycle is the sequence of activity entailed in choosing, doing, and completing work; the conclusion of a work cycle is determined not by the completion of a given task, but by the child's psychic needs" (p. 68-69). The environment created for students is carefully designed with student needs, student interests, order, a limitation of materials (so only

supplies that foster development are accessible), and nature are the focus (Montessori, 1964). This kind of learning through play is created and administered by specialized educators, with student inquiry and play as the focus.

Chapter 3: Methodology



(Illustration of student playing soccer during free play time)

Epistemology, Theoretical Framework and Methodology

My epistemological approach for this study is the constructivist model, where students construct knowledge and meaning from their experiences with unstructured play. The constructivist model promotes exploration and discovery learning where students create meaning and transform information through play. Constructivism promotes learning as an active process where knowledge and meaning are constructed based on personal experiences to make sense of the world. By allowing students unstructured play periods, students play a part in their own learning and meaning making. In this narrative study, I construct a story based on the individual student

stories collected from this group of second graders with unstructured play, discovery learning and meaning making.

I used a combination of both the narrative inquiry approach, which allows for the stories created through unstructured play to be told, and autoethnography, to describe students at play from my own experiences and perspective. Narrative inquiry is the process of gathering information for the purpose of research through storytelling. "Humans are storytelling organisms who, individually and collectively, lead storied lives. Thus, the study of narrative is the study of the ways humans experience the world" (Connelly & Clandinin, 1990, p. 417). Students experience their world through play and imagination. Utilizing these techniques in the classroom while storytelling could lead to a more cohesive learning environment.

Paley argued that, "Teachers… should use storytelling as a teaching and learning device" (2011, p.92). When this concept is understood many classroom situations can be imagined. "Pretend we're lining up like penguins tiptoeing on ice… Pretend we're like giraffes with long, straight necks… Like baby ducks following their mother" (Paley, 2011, p. 92). Through pretending and using one's imagination, "there is suddenly a focused community. The children have been treated as actors, not outlaws. Children's play helps them focus on common problems in the format they know best: story" (Paley, 2011, p. 93). If teachers and students are encouraged to use their imaginations, they could find themselves as characters in various stories throughout the school day which could lead to expanding lessons and creative thought processes for students. Students and teachers could find themselves "being kinder and more respectful to one another

because our options have grown in intimacy, humor and literary flavor" (Paley, 2011, p. 94).

Times for learning through play, the expressive arts and the emphasis on sociality has decreased as the time spent on direct instruction and measurable academic skills has increased, (Dyson, 2018). A perceived gap in learning has been observed between white students and students of color during this time of focused academics and has been steadily increasing as we continue to educate our students in this way. Students are to move up the "linear ladder of academic skills according to the strict tempo of school districts' benchmarks" while important time for discovery and unstructured play are being diminished (Dyson, 2018, p. 6). "This narrow focus has long been evident in schools serving low-income children… Given the differences in children's home experiences, one might imagine that the institutional emphasis would be placed on building on students' experiences to support diverse learners" (Dyson, 2018, p. 6). By using unstructured play and storytelling methods throughout students' educational lives teachers can help students in "expanding vocabulary, imagery, social awareness, and the valuable idea that we can choose different outcomes for most of our actions" (Paley, 2011, p.93). When students are allowed to play and create stories they build community, create relationships, and learn.

In my research, I use play theories from Vygotsky, Froeble, Dewey and Kolb, while modeling my research after Vivian Paley and Ann Haas Dyson.

In the school setting where I work, students were given time each day for authentic play. Vygotsky's theory of sociocultural development was seen as students

participated in imaginative play. Role-playing, storytelling, cooperative play, and the skills these kinds of play encourage, play a central role in the process of "meaning making." These social interactions described throughout Vygotsky's work allow students to build community through play. Fröebel's theory of learning through play, specifically in nature and how students fit into their worlds, is another important theory for my study. His belief in "self-activity" and self-expression through play was seen through the activities and storylines students created while playing outdoors with peers. Dewey's theory of "learning by doing" was observed in a variety of ways. Because this is a hands-on approach to learning, students are encouraged to explore, adapt, and interact with their environments. This theory of learning by doing was witnessed when students were engaged in discovery play, including outdoors, indoors, cooperative, and individual. Kolb's experiential theory of learning, "involves the acquisition of abstract concepts that can be applied flexibly in a range of situations" (Kolb, 1984, p. 38). Providing play times provides students with new experiences and allows for more in-depth learning.

Although these researchers used teachers as guides throughout their experiences with play, students in this study were given authentic play periods without adult interruption, guidance or interference. Students were allowed to take the lead when they played and created experiences for themselves and their peers.

My research is modeled after the participant-observer method used by Dyson, combined with action-research/teacher-researcher perspectives. I observed students, participated in activities (when invited), and told the story of students and their

experiences with learning through the lens of play. I, like Graue and Walsh (1998), think about research with kids as:

> A disciplined and systematic form of hanging around with kids who are smarter about their world than you are… We prefer generating data to the more common "collecting data." Data are not out there, waiting, like tomatoes on a vine, to be picked. Acquiring data is a very active, creative, improvisational process. Data must be generated before they can be collected. If research is the process of soaking and poking, we emphasize the poking over the soaking, or better, first poke and then soak. The researcher is not a fly on the wall or a frog in the pocket. The researcher is there. She cannot be otherwise. She is in the mix." (p. 91)

Because "research is a collaborative document, a mutually constructed story out of the lives of both researcher and participant," (Connelly & Clandinin, 1990, p. 418) I gathered the stories of my students during unstructured play periods and constructed a narrative of my students' experiences. The goal of this narrative research study is to find common themes that indicate learning through play by observing and interviewing a small group of students.

Through field texts written during unstructured play periods I gathered stories of learning, discovery, cooperation and shared learning. "Central to the creation of field texts is the relationship of researcher to participant… Researcher relationships to ongoing participant stories shape the nature of field texts and establishes the epistemological status of them" (Connelly & Clandinin, 1990, p. 419). As a researcher I

needed to be aware of my role in this research. For this study, I actively participated with this group of second graders. This collaborative relationship benefitted my narrative study as participants felt confident sharing their experiences with me. They were active participants in the telling and reliving of their stories shared through the research study. Vivian Paley (2011) articulated the importance of creating relationships with students through storytelling when she wrote, “if you take down their stories, you like them. If they know you’re taking down their stories, they like you. And we start liking each other” (Paley, 2011, p.93). This kind of relationship with students creates a space for free and open dialogue between students and teachers where students feel like their stories matter and feel that their stories are important enough to share.

Methods

I chose narrative inquiry methodology for this study because the stories of student experiences with unstructured play are best addressed through a narrative perspective. Narrative inquiry focuses on the stories of individuals - a storytelling approach (Creswell, 2007). In this narrative study, I gathered stories of unstructured play, discovery, cooperation, and imagination through the experiences of a classroom of second graders.

In this study, narrative inquiry has a constructivist approach, as we are observing the participants of this study to see how they are constructing their own understanding and knowledge of the world through their experiences with unstructured play. Learning through play is “a necessary and fundamental mechanism for knowledge acquisition

and the development of both cognitive and physical skills" (Roussou, 2004, p.4). Students retain about 20% of what they hear, 40% of what they hear and see and 75% of what they hear, see, and do. Therefore, students who learn while playing retain much more information than if unstructured play was not a part of their educational experiences (Roussou, 2004, p. 5). Current thinking throughout the educational field about how learning takes place emphasizes a constructivist approach, where learners must actively construct knowledge by drawing it out of experiences that have meaning and importance to them (Dewey, 1966). Participants in this study constructed their own knowledge by testing ideas and concepts based on prior knowledge and experience, applied them to new situations, and "integrated the new knowledge with pre-existing intellectual constructs" (Roussou, 2004, p. 4). The individual continually constructs hypotheses and attempts to generate knowledge that are pieced together to form new knowledge and understanding.

Through narrative inquiry I observed, as a participant observer, the ways in which students learn through unstructured play. This study was conducted at Jamestown School, where I have been teaching for 12 years. I have built relationships with students, staff and families. With IRB approval for this study, forms for consent were created, sent, and collected. I then designed an observation protocol method for recording field notes to include narrative, descriptive and reflective notes (Creswell, 2007, p.134).

For this narrative study, 8-10 second grade students (one class) were observed during unstructured play times at school. By selecting a small group of students to

participate, detailed experiences with play, discovery, cooperation, and shared learning have been recorded. Spending considerable time with these students allowed for an in-depth gathering of stories and experiences with play. This was done through observations of these students at play during school hours, including recess, gym, lunch, and core classes (when unstructured play is encouraged). This study was conducted at Jamestown School in a mid-sized Midwestern city in the United States for one school year. Observations were done weekly; interviews held every other month. Information for this study was gathered through:

- Daily Observations (During unstructured play & school hours; Field Notes, Digital Recordings)
- Interviews with each student (8-10 Students, Digitally Recorded, Observational Notes)
- Review of Educational Records of Students

Observations were recorded in field notes daily and include digital recordings of students during unstructured play periods. Interviews were held with individual students every 6-8 weeks to discuss their thoughts on play, specific conversations held during these play periods, what they feel they are learning while playing and any other topics regarding play and/or the research project. Interviews took place in their schools, in a room of their choosing - including their classrooms, library, resource room etc. Interview questions for students in this study included:

- Tell me about the game/activity you were playing.
- How did you decide who would play which roles?

- Tell me about how you worked through or solved the disagreement/misunderstanding during your game.
- How did you decide who was allowed to play this game? Who decided on the participants? Could anybody play with you?
- What did you enjoy about your time to play? Was there anything you did not like about playing today?
- What did you learn while playing?

These interviews were done with individual students and were digitally recorded, with observational notes taken.

Data Analysis

In narrative inquiry the primary purpose is for participants (in this research study, students), to share their life experiences and personal stories to create a thorough narrative. Connelly & Clandinin (1990) describe this type of research as:

> Studies of educational experience. One theory in educational research holds that humans are storytelling organisms who, individually and socially, lead storied lives. Thus, the study of narrative is the study of the ways humans experience the world. This general concept is refined into the view that education and educational research is the construction and reconstruction of personal and social stories; learners, teachers, and researchers are storytellers and characters in their own and other's stories. (p. 2)

Taking raw data collected in the field to a well-written completed text includes multiple steps such as, “generating data, dealing with the text of the data, and constructing a text, and crafting a narrative for the reader to consume. (Graue & Walsh, 1998, p. 160). Experiences and stories have been gathered and recorded from students at play in school. All recordings of students playing, exploring and engaging in play have been watched, listened to, and transcribed - some with illustrations - to start the data analyzing process. Each interview was also recorded and transcribed with notes on tone, facial expressions, and body language. After all field notes, digital recordings and interviews were transcribed, data was read/listened to a minimum of three times to ensure understanding.

Analyzing or interpreting data is a complicated and multi-step process. Interpreting the data, categorizing, and coding each interaction, and writing a cohesive narrative is a complex and daunting endeavor. As Denzin describes:

> In the social sciences there is only interpretation. Nothing speaks for itself. Confronted with a mountain of impressions, documents, and fieldnotes, the qualitative researcher faces the difficult and challenging task of making sense of what has been learned. I call making sense of what has been learned the art of interpretation. This may also be described as moving from the field to the text to the reader. The practice of this art allows the fieldworker to translate what has been learned into a body of textual work that communicates these understandings to the reader. (Denzin, 1994, p. 500)

Through field notes, conducting interviews, and transcribing recordings, “you gain cognitive ownership of your data, and the intuitive, tacit, synthesizing capabilities of your brain begin sensing patterns, making connections, and seeing the bigger picture. But there are also systematic ways of reorganizing and reflecting on your qualitative data to help you along” (Saldaña, 2011, p. 90). Through inductive coding I made meaning of the data I have collected observing this group of students. Inductive coding and analysis are grounded in the data. It is “what we explore and infer to be transferable from the particular to the general, based on an examination of the evidence and an accumulation of knowledge” (Saldaña, 2011, p. 93). By using narrative inquiry in this study, I hope to “create an evocative portrait of participants through the aesthetic power of literary form. A story does not always have to have a moral explicitly stated by its author. The reader reflects on personal meanings derived from the piece, and how the specific tale relates to one’s self and the social world” (Saldaña, 2011, p. 128). I also told my students’ stories through my own experiences observing and participating in their play. As Stake (1995) describes, understanding from “direct interpretation of the individual instance” (p. 74), in this case, an autoethnography of the stories recorded from students, allows for a thorough understanding of the data through the lens of the researcher.

Another “approach to understanding the social world is to discern its patterns and to construct human meanings that seem to capture life’s essences and essentials… The purpose and outcome of data analysis is to reveal to others through fresh insights what we’ve observed and discovered about the human condition” (Saldaña, 2011, p.

90). Employing Saldaña's ideas and methods for data collection, the transcribed data was grouped based on play categories established during observations and interviews. These include student discoveries during play; cooperation during play; questions being discussed during play; and learning/sharing of information during play. When these and other key areas of study were identified, the story began to unfold. Stories for each category were identified and described. "Categorizing is organizing and ordering the vast array of data from a study because it is from these larger and meaning-rich units that we can better grasp the particular features of each one, and the categories' possible interrelationships with one another" (Saldaña, 2011, p. 91-92). Through these stories, categories, and epiphanies, interpretation of the larger meaning of the story is being discovered. Results have been organized into a concept map, where plot, themes and actions were listed and grouped (Creswell, 2007, p. 155).

After discussing the discoveries, cooperation, questions, and learning/information sharing of students during play, sections focusing on each student commenced. Each student's personal story of learning - their discoveries during play; how they cooperated during play; questions they discussed during play; and any learning or sharing of information that happened during play - were highlighted and discussed individually. This was done through interviews with each student. By centering the findings around each student, their individual stories and experiences become the focal point of chapter 4 in this research study.

Finally, a summative chapter connecting multiple student stories into one collective story was written. This included themes found across the study, giving a

broader perspective of students at play in schools. “Emergent patterns, categories, themes, and concepts… the possible networks (links, connections, overlaps, flows) among the codes, patterns, categories, themes, and concepts” (Saldaña, 2011, p. 102) were examined individually and then collectively to paint a picture of the happenings of students at play during the school day.

Discussion

As Maclean extrapolates, “all there is to thinking [research] is seeing something noticeable which makes you see something you weren't noticing which makes you see something that isn't even visible” (Maclean, 1976, p. 92). “Finding it out requires inquiry that gets below interaction... We see the research process as having three levels: (a) the everyday observable, (b) rich description, and (c) theorized explanation, that is, getting at the invisible or unobservable” (Graue & Walsh, 1998, p. 94). My research combines observations, interviews, experiences, and stories to create a narrative of students at play in school.

Results from this study are grouped by student and themed categories. Each student’s experiences have been grouped into four categories: student discoveries during play; cooperation during play; questions being discussed during play; and learning/sharing of information during play. Stories that represent each category have been highlighted. Meaning created by students through unstructured play were noted for each category. Writing individual narratives about each student and how they

actively constructed meaning based on their personal experiences with unstructured play are how these results are being shared.

I then took the stories of individual students and combined them into a summative account. Stories about specific experiences were coded into groups to compare and contrast between individual and group findings. These narratives are shared in a separate chapter based on the categories listed above and other key codes that manifested during observations and conversations.

The goal of this narrative research study is to understand how children at school experience play, and to promote unstructured play in schools as a way for students to discover and make meaning of their world. Sharing individual student stories then combining them into a summative story comparing experiences and observations make this a comprehensive narrative study in play.

There are some limitations to consider when doing a narrative research project. Because “the purpose of research with children should be to get at and underneath the day-to-day realities of those kids” (Graue & Walsh, 1998, p. 145), the relationship between researcher and participant is very important. Without a strong and trusting relationship between researcher and participant, the narrative would be weak and lacking the depth necessary to create a robust narrative study. As the researcher writes the stories gleaned by field notes and interviews, we must consider voice (Connelly & Clandinin, 1994). The interpretation of the narrative told by the researcher must be considerate of the participants in the study and must represent participants accurately and appropriately. Another limitation could be that although working with such a small

group of participants (8 students) gives depth to the narrative research, it also may not be an accurate representation of all students in second grade or students in other grades at elementary schools.

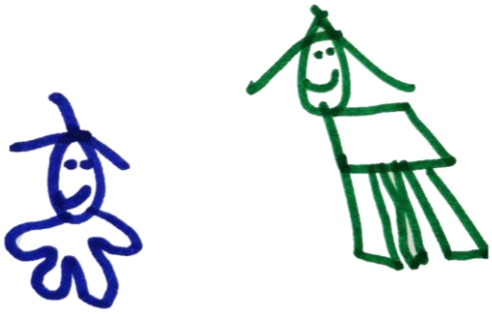
My personal experiences could also be a limitation to this study. As the transcriber of all notes/recordings, my feelings and biases regarding unstructured play could play a role in the interpretation of my findings and the writing of the narrative. Subjectivity is also a limitation of this narrative study. My background as a teacher who has a relationship with these students may cause me to have biases regarding certain students and/or students may be biased for or against me based on past experiences in my classroom. Through self-reflection and journaling, I became more self-aware. Because "we cannot step aside and be 'objective' about what we see and write" (Creswell, 2007, p. 230), I hope to let my personal experiences, culture, history and background reflect in the narrative of my own experiences as well as the experiences of this group of second graders.

> "We must recognize that participants in the field, readers, and other individuals reading our accounts will have their own interpretations. Within this perspective, our writing can only be seen as a discourse, one with tentative conclusions, and one that will be constantly changing and evolving." (Creswell, 2007, p.231)

This research study and findings contribute to educational practice and policy by advocating for the reshaping of what a classroom could look like for students and educators. By allowing and encouraging play during the school day for all students,

much needed times for exploration, collaboration, discovery, and idea sharing will occur. Advocating for play in schools could create a more equitable educational system, where students are the focus instead of standardization of education.

Chapter 4: Findings – Individual Student Stories



(Illustration of a field trip to a farm to see cows)

My research combined observations, interviews, documentation of students' experiences, and stories of these to create a narrative of students at play in school. These narratives were shared based on the categories listed in the previous chapter and other key codes that manifested during observations and conversations. This chapter focuses on the individual student. Each student has a story to tell. In this chapter, narratives about four individual student experiences during play are told through interviews conducted at school. Individual student narratives give an important insight into how students view themselves, their peers, school, and their world. These narratives are a compilation of stories from the 6 individual interviews held with each student, every other month, throughout the school year. Questions addressed during these interviews include describing the game/activity students were playing; how

students decided who would play different roles in each game; how they worked through or solved any disagreements or misunderstandings that occurred during play; decisions about who was allowed to play; talking about what they enjoyed most about their times to play; what they did not like about playing; and anything they learned from playing. These children were chosen for discussion because they represent differences in kinds of play and show variety in their interests. These students also represent various groups of students, meaning that students were categorized and grouped during data analysis into classifications of play styles – including kinds of play (house, group games, imaginative play, playing with words/drawings, building, collaborative/cooperative play, discovery/explorative play, etc.), and self-selected types of students (love/dislike school, active, quiet, thoughtful, passive, pugnacious, questioning, competitive, varied behaviors). These 4 students represent a diverse cross section of the students participating in this study.

Penelope

(Self portrait of Penelope)

Penelope is an excited, energetic, happy child. She is 8 years old and in 3rd grade. She loves school and her friends. She would rather be playing outside than inside but is adaptable when the weather is unpredictable – or when they have free time indoors. Her goal in life is to get a puppy. Penelope loves being able to leave class to be interviewed and always asks when the next one will take place, or if she could have "extra ones." She is bright, silly, and inquisitive, and asks numerous questions to teachers and leaders about the content being taught or when we are on field trips concerning the why and what of our adventures. She is comfortable and confident. For the purpose of this study, Penelope is categorized as an active, questioning, school-loving player who enjoys group games, imaginative play, collaborative play, and playing with small groups.

Penelope excitedly bounces into the classroom she's chosen for her interviews – the STEAM (Science, Technology, Engineering, Art, Math) Lab – one of her favorite places. Penelope starts each of her 6 interviews by grabbing a rocking chair and dragging it across the classroom to a place on the carpet near the window. She gets comfortable and starts rocking, ready to tell me about her adventures in play. Each interview is between 10-30 minutes long, depending on how in depth and detailed her stories are that day. She yells, "Ready!" when she's ready to start.

Researcher: "Hi Penelope! I'm so happy to see you today. Are you ready to tell me some stories?"

Penelope: "Ready! Let's do it! I gots a LOT to tell you."

Penelope always has a lot to say about school and playing with her peers.

I ask Penelope to tell me about the games she's played each week we meet. She rocks faster in her chair, getting ready to share her stories. Sometimes they are games with groups, sometimes in pairs. Once in a while, Penelope plays by herself. Usually, friends join her after a short period of alone time. She seems happy to have the company.

Penelope: "This time we were playing kickball. Well, it was just me and Natalya. But we had the ball, and we were on our own team. Like I was one team, Natalya was the other team and we were rivals. I was trying to kick her butt. Ooo… Can I say 'kick her butt?'"

When it was confirmed that yes, she in fact could say, 'kick her butt' during our interview, she continued.

Penelope: "Ok good. Because I really was. I'm a super good kicker cuz I play soccer too. So, I kicked first. She rolled the ball, and I kicked it so far that it went by the cars! A teacher had to check first, then Natalya ran and got the ball, but I was so fast that I got a home run!"

When asked how they decided on who kicked first, Penelope explained that she went first because they did bubblegum (a shoe counting game to decide who's in or out). Then they took turns as the kicker while playing kickball because "otherwise it wouldn't be fair - kicking is the funnest part of the game." This was decided at the start of the game. As they played together, other students asked to play. When explaining the

intricacies of adding players into an already started game, Penelope explained that "everyone can play. We don't just decide. If they say, 'can I play?' We just let them play!" This commonly occurs with team style games, including kickball, four square, basketball, and dodgeball. This story shows how play enabled Penelope to understand how to play cooperatively with teammates and newly added players.

Though, this is not the case with every game. Penelope described an issue with players entering mid-game while playing something called Puppy (a 'house' style game where there are usually adults/caregivers and babies). Players had decided on the rules before playing. In this case, there had to be an adult puppy and a baby puppy. They could talk in 'regular' language but had to bark at the beginning and end of sentences. They also had to use an altered voice – either higher or lower in pitch based on whether you were the adult or baby. Players could walk around normally but were required to crawl when barking. Penelope and Natalya were playing together with Penelope as the baby puppy and Natalya as the teenaged babysitter puppy. They would switch when 'the big kids' came outside, which was around halfway through recess.

Penelope: "We were playing puppy this one time and Mato came in and wanted to play. We said he could be the older brother puppy because he's bigger than us. Then we played a while and he changed into the BABY puppy! What!? (Exasperated sigh). So, Natalya yelled at him to be the right kind of puppy but he said he hated that puppy. He only was gonna play if HE was a baby puppy. But we already had TWO BABY PUPPIES! Everyone can't be a baby puppy or nobody takes care of us. So, I kicked him out and said he couldn't play anymore. Cuz he was cheating at my game."

Penelope was upset that Mato did not follow the rules agreed upon for this game. She and Natalya had already designed this game and how to play and had explained this to their new player. She did not appreciate that this player came in wanting to change the rules of their game. She thought the rules were clear, so when they were broken, the player breaking the rules was no longer allowed to play. When asked about how they thought that player might feel about being kicked out of the game, she said that it was "just too bad. If you break the rules, that's what happens." When asked about how she might have felt if this had happened to her, Penelope said, "still too bad. I woulda been sad for a minute, then I would just go play something else. Rules are rules." This example of play demonstrates that Penelope has learned about the importance of rules and guidelines when playing, and although she enjoys playing cooperatively, those that break the rules or do not follow the guidelines are no longer welcome to play.

Penelope also explained how usually when there is a disagreement when playing, all players talk about it together to decide how to fix the issue. Sometimes players are asked to leave the game, but most of the time they come up with a solution that works for everyone. When asked about a game disagreement, Penelope said, "boy, have I got a story for you."

Penelope: "Last week we were playing Cherry Bomb (a freeze-tag game where the 'it' can only tag you if they can reach you from the ground, or if you touch the ground). It was super fun. Booker got 'it.' We were all hiding up on the playground, but Booker is super tall, and he kept jumping up to get us. He was like 'ah! Ah! AH!' (Jumping sound effects with arm movements). Then Teddy almost fell off the playground when he

jumped to the slide. Booker was thiiiiiiiis close. But he missed. Then Mato tried this sweet twisty jumping move on the monkey bars. But Booker is so tall he could reach him! So, Mato got tagged and was super-duper mad. He yelled at Booker and said he was a cheater. Then yelled that he quit – like a baby. Like, just be 'it' already. Then Booker yelled at Mato that he wasn't a cheater, and that Mato was a bad sport. So, we all came down from the playground. We all saw what happened, so I said that Booker tagged him (Mato) fair and square. Natalya said she saw it too. So did Teddy. Teddy told Mato not to quit and that maybe we could have 2 'its' for the next game. I didn't really like that idea, but everyone else did and nobody was being bratty about it. So, we started a new game and everyone played again with 2 'its' which was waaay harder than one 'it' but it was still fun."

Penelope describes the ways in which the rules were changed during their game of Cherry Bomb. She didn't appreciate that Mato wouldn't follow the rules of the game, even though they were decided upon before playing. After disagreeing on whether or not Mato had been tagged, Teddy came up with a solution. The solution was to allow Teddy to help Mato and have two people tagging the rest of the players instead of one. This solution encouraged Mato to continue playing while not breaking the rules entirely. This story highlights how play allowed Penelope to understand the importance of adaptation and change to make the game more cooperative and inclusive for all players.

Playing is one of Penelope's favorite things to do. She enjoys playing outside with her peers. She has a best friend that she usually plays with, but happily invites

others into whatever she chooses to play. Play times are always described with enthusiasm and charisma. They are her, “favoritest times of school.” When asked to elaborate, she happily obliges.

Penelope: “Play time is the best. You get to do whatever you want! When we go outside is my favorite because we get sunshine. Sometimes cloudy sunshine but it still makes a shadow. Then you can chase your shadow with your bestie. I always play with my bestie because she’s the best. And we have the same clothes sometimes. Like TWINS! But our hair and skin are different. So, we pretend we’re twins and do twin stuff… Like when you say the same thing at the same time. Or we make our hair look the same, like braids. But I don’t know how to braid so she braids mine too. Then we trick all the other kids! Cuz then they think we’re really twins. And I’ll say my name is Natalya and she says hers is Penelope! Even the teachers get tricked! Hahaha.”

When asked if there was anything she liked or disliked about playing, she says, “I always like playing! We get to do whatever we choose. Like I can play house or tag and then I can change and go to foursquare or pick flowers. If I’m mad at someone, I can go play something else with another friend! I’m not stuck like in class where they pick your partners even if you say that you don’t like them because they were mean or called you a ‘stinky butt.’ (Giggles). Then teachers say you have to be partners anyways and be friends. When we play outside, we get to play with our real friends and explore stuff and try new stuff. Like when we learned how to do braids? I still can’t really do braids but I can pretend and do a twist. It kinda looks like braids. I sat by another friend and she showed us braids on Natalya because she gots long hair. Then I tried to braid on Eily

but mine was TERRIBLE with braid chunks everywhere. But Natalya tried mine and I had princess hair the rest of the day. WITH flowers."

This story demonstrates how play enabled Penelope to understand how to learn new skills through play and share learning and knowledge with her peers.

Researcher: "Is there anything you don't like about playing?"

Penelope: "Not really. But when everyone fights that's not the funnest. Then you get mad and in trouble. Like when someone is playing your game like a cheater. They just wanna win but then you see they cheated and everyone yells 'cheater!' and then nobody wants to play with them because they weren't nice."

Penelope goes on to explain in more detail.

Penelope: "Last time, when we played foursquare, and Viv wanted to be the king but I was the king first. So, he hit the ball super hard and it hit me and I cried and yelled at him. Then Patty and Natalya said he was the meanest and yelled at him that he was a mean bad cheater. Cuz you can't hit the ball in someone's face really hard. You're just trying to trick them and hit it a different way to win. Then EVERYONE got in trouble after recess because Viv tattled and LIED and we had to have a meeting in the hallway. (Penelope rolls her eyes). Then we told what happened and VIV got in trouble but we didn't cuz he was bad. But I don't like when anyone's in trouble so I don't like when people fight or tattle."

Penelope does not like conflict. Her only unpleasant moments in play revolve around conflict and disagreements. She is eager to allow everyone to play with her but does not allow rule breaking or discord. She expects people playing her games to follow the rules that were collaboratively set up before the playing started. She has strong feelings about tattling and peers that purposely try to get others in trouble. Penelope's strong sense of rules and ethics makes her fiercely protective of what's right – especially if students are playing a game that she's made up. This narrative is another example of how play has enabled Penelope to understand rules and how to determine what is right or wrong when playing.

When asked about what she's learned while playing, Penelope says she, "always learns stuff. Like how to play new games and how to do new stuff." She explains that, "I never knew how to braid or that we had foxes by school. I learned manners – like don't run to all the dogs cuz one might be kinda mean and then you'd get eaten by them and be a zombie. And teachers can't let zombies be at school or all the kids would be zombies." She's made new friends, some with the 'big kids.' When reminded about some of the field trips and adventures in the neighborhood she thinks with her finger on her forehead.

Penelope: "Remember when we went to that pond with all the goo creatures? Like the little bugs and stuff? And I was by the edge trying to get some in the net? Then I had Natalya hold my hand so that I could reach even more farther? Did you know that I almost FELL IN? My foot slipped on the mud and my whole foot went in the mud water! MY WHOLE FOOT! I screamed and Natalya and Marimar pulled me out. My foot was

soaked all day. But I learned that mud is slippery. Like super slippery. And we learned about all those cool creatures and that biting one! The giant one that flies and swims and bites people! We learned that if you stick your goo on a mic-er-scope that it makes you see teeny bugs swimming in that water. Wait… Ms. Steffenie? DO WE SWIM IN BUG WATER ALL THE TIME??"

Penelope has learned many things through play. During recess, on field trips and in classes, she's learned how to collaborate, find solutions for disagreements, explore, and use her imagination to create new ways to learn and play. Play has shaped how Penelope participates in school. She works more willingly with her peers, has learned to compromise, and feels connected to school and learning through the friends she's made while playing.

Mato

(Self portrait of Mato)

Mato is a very energetic, animated, emotional student. He is 7 years old and in 2nd grade. He likes all outdoor activities and has a few close friends at school. He also

loves playing indoors – board games, computer games, Legos, or other forms of building. His goal is to learn to drive – as soon as possible. Mato loves the individual attention of the interviews and proudly walks into each interview. He is kind, smart, and outgoing, often to the point of disruption. He openly questions teachers and other authority figures. He is confident and entertaining. For the purpose of this study, Mato is categorized as a pugnacious, school-disliking, highly competitive player with variable behaviors, who enjoys group games, imaginative play, cooperative play, and playing with words and drawings.

Mato confidently walks into his chosen classroom for interviews – the library. He loves books and the cozy space our librarian has created. He starts every one of our 6 interviews by snuggling into a giant beanbag chair, pulling another one across from him for me to sit in. Mato's interviews are usually around 15-20 minutes, depending on his speed of storytelling. When he's ready to start, he looks me straight in the eyes, fingers tented together under his chin, and says, "Ok. Go."

I ask Mato about the games and play times he's participated in each week that we have interviews. He squishes a little deeper into his beanbag, getting comfortable. Mato likes playing indoors and outdoors. He usually plays with a core group of friends. He does not enjoy playing alone. Mato will join other play groups if he finds himself without his usual cohort.

Mato: "This time we played dodgeball! It was so fun. We had like me and Teddy and Booker and we started playing. We were in the grass, so everyone had their own team

and we kinda like made a triangle. But like a BIG one so we could throw the balls at each other. It was the coolest. Usually, we play with a million people. But this time it was just us. We had 2 balls so we had to run around a lot."

Mato explains that this game is usually played with all the balls in the gym and their whole class. Half of the students on one side of the gym, half on the other. Then the teacher blows the whistle, and everyone runs to get a ball to throw at their opponents. This was their version of the game with fewer people and balls – and it was played outside in the field behind the school.

Mato: "Booker is tall and fast but doesn't throw too good. Teddy is like the best thrower in the whole grade, so you gotta duck and run and weave. We made boundaries so Booker couldn't just run all the way to the playground. I'm pretty good at throwing but really good at strategy. I can tell where they wanna throw and run away from there real fast."

Mato explained that he was the starter because he came up with the idea to play. His peers accepted this because this is how most roles for games are chosen within his friend group – by who decided on the game to begin with. Rules were created collaboratively so that everyone would want to play. Rules for this game included agreed upon boundaries, players, and number of balls (which was an easy decision because there were only 2 balls available for use). Mato started the game by throwing the balls in the middle of the triangle and running back to his spot in the corner. This was agreed on before play, as each student would be the same amount of space away

from the dodgeballs. They all yelled, “ready, set, go!” together when Mato signaled the group with a 5 second count down on his fingers (while yelling, “5, 4, 3, 2, 1”).

Mato: “Then we played for a little while and Chooch and Jack wanted to play too. We thought it would be funner if we had more people, so we let them in. It WAS way funner. We made like a 5 corner square. Wait, what are those called?”

Deciding that pentagon was the shape name he was looking for, he explained that they had to redraw boundaries because now the shape was different due to the number of players and corners for each player to start in.

Mato: “But then we played again and Ketan wanted to play too! So, we had to make a hexagon! I remembered that shape because I was making a thing with those Tangram thingies in math. But we decided after everyone was in their spot that maybe this was a kinda dumb way to do it because WE COULD JUST HAVE 2 TEAMS! Duh!” (Hits his forehead with the palm of his hand while shaking his head).

This game play shows how Mato is learning adaptability and how to collaborate with his peers during play. Students decided to change the rules when they didn’t fit the game anymore. They changed the shape and the amount of space to accommodate the new players. As they added more players they adapted the game again, starting with a triangle, changing to a pentagon, and ending as a hexagon. When the shape wasn’t conducive to the kind of game they wanted to play, they changed it to a team game instead of an individual game. When asked about adding players and deciding on teams, Mato described the “fairest way to choose.”

Mato: “Well, when other kids want to play, we just play! Nobody says no to people who want to play. Then it’s fun! Maybe everyone can play. Remember when we asked you to play too? You kicked the kickball over the WHOLE PARKING LOT!!! It was awesome.”

When asked about creating fair teams, it was a little more complicated.

Mato: “Teams can make people mad. I always want to be on my friend’s team – like we’re all friends – but I’m really friends with Teddy and Booker the most. So, I want to be on their team. But when we had Chooch, Jack and Ketan then it’s more hard. I like them too but not like my best friends. So we did bubblegum. Do you know bubblegum? I’ll show you.”

Mato proceeds to tap my foot, then his foot while singing a song about bubblegum. Each tap is on beat, and when the song ends, the person’s foot being tapped is out. They decided that the first 3 people out would be one team, the people left over would be the other team.

Mato: “But then Brian came – he’s a big kid (upper grade level). Then everything was messed up. He’s old so he gets everyone out super fast and wins. So, we let him play a little, but then kicked him out. He’s too good and it wasn’t fair. His team always won! And then it kinda turned into everyone versus Brian which was fun too. Like big kids versus the REALLY big kid. We tried to beat him but couldn’t. We were all out all the time. He didn’t care but we didn’t have fun anymore. So, we kicked him out.”

That was not the end of this story, however, because Mato described a calm resolution to a problem. This was not what was observed. What was observed was a very upset student becoming emotional when hit with a ball – making him 'out.'

Mato: "Yeah, I guess I was super mad that last time. I really HATE losing. So, I yelled at BRIAN in his face, and told him he was the worst kid at the whole school. I was crying yelling cuz I was so mad. My friends came over to say to chill out but I couldn't because Brian is the worst and hit me on PURPOSE. (Which is the point of the game). So, I yelled more and screamed. Then I ran away to the playground and hid from my friends."

When asked about running away and if he was upset with his friends, Mato said, "No, not really. I was just so angry and I wanted to leave cuz I hate crying and I couldn't help it. I just was. Prolly cuz when I'm mad, I cry. So, I was hiding cuz only babies cry and I'm not a little kid."

This story demonstrates how play allowed Mato and his teammates to cooperate and work through a difficult and emotional situation together – removing a player from the game. Although the rest of the team had a discussion and came to a consensus, Brian was not involved in the decision-making process. He was voted out of the game for being too competent. This was the 'fair' way to remove a player, especially an older student. When asked if Mato would like being kicked out of a game for winning he said, "I wouldn't care. If I was playing little kids and kicking their butts, I SHOULD get kicked out." Mato also shared that when he's upset, he has little control over his emotions and sometimes gets so upset that he chooses to remove himself from the situation. He did

choose to rejoin the game after his friends came to find him (after his temperamental exit). Brian did not return to the game.

Mato explained that he loves to play but hates to lose. He always learns something – whether it's how to be a good negotiator or how to strategize a game more effectively.

Mato: "I learned from this one. Playing dodgeball is WAY easier in the gym. There's more balls and space. The teacher just picks the teams, so there's no fighting. It's really hard to pick teams. Even bubblegum, you can kinda cheat by knowing which foot to start with and counting before you do it. I learned I'd rather play a little game with my favorite friends than a big game with lots of other kids. And I DON'T like playing with big kids. They cheat. I dunno. I just like my friends better. I also learned from last time that if you take your shoes off to dump out the junk, you gotta watch for bees. They're tricky little buggers. Remember I had to get an ice pack cuz I stepped on that giant bee?? I definitely learned that bees DO NOT mess around."

Mato: "But I think I learned most that I don't need a million friends. Just a couple. Like 2. Then I'm happy and we can play all the games and because we're friends, we don't really fight like when we added more people to my game. We just kinda play stuff and make our rules the way we want."

Mato doesn't mind a bit of conflict but gets emotional when challenged. He is quick to provoke and always ready to debate. While he doesn't like to make people feel bad by voting them out of the game, he can always reason with the player and justify his

position. If he doesn't get his way, he storms off until he's feeling confident enough to return. He doesn't need a large group of friends; he is happy with just a few close ones. He enjoys games where he can create the rules and design the game to fit the needs and goals of his friend group. He is learning to work through disagreements without yelling or storming away. Having a close group of friends who truly care for him helps this process.

Natalya

(Self portrait of Natalya)

Natalya is an inquisitive, talkative, cheerful child. She is 8 years old and in 3rd grade. She loves her friends and tolerates being at school. She happily plays indoors or outdoors, depending on her mood. Her goal in life is to, "fly in a rocket." She happily leaves class to participate in interviews and brags to her classmates when she leaves. She is funny, excitable, and clever. She's always thinking 3 steps ahead of her teachers

and peers. She loves to learn and explore, but on her own terms. For the purpose of this study, Natalya is categorized as an energetic, problem-solving, school-tolerating player who enjoys house style games, imaginative play, collaborative play, and playing on a team.

Natalya dances into the classroom she's picked to conduct her interviews – the Makerspace corner of the STEAM (Science, Technology, Engineering, Art, Math) Lab. This corner is filled with making materials – tools, cardboard, cloth, beads, connectors, etc. Natalya prefers to be creating while answering interview questions. She starts each of her 6 interviews by choosing a few items to start building – usually cardboard, a saw, markers, brads, and some yarn or pipe cleaners. Each of Natalya's interviews are around 20 minutes, just enough time to, "make something cool." When she's ready to start, she puts all the making materials in front of her and says, "Okay! Let's go!"

I ask Natalya about how she's chosen to play each week she participates in an interview. She usually plays with one specific friend, but happily accepts ANOTHER into whatever game they've chosen to play. Natalya does not choose to play alone. She will always find a friend or group to play with.

Natalya: "I went outside, and nobody was playing kickball, so I asked Penelope because she's my best friend. But kickball with 2 people is SO BORING! You need TEAMS. So, we went to everyone outside to see if they wanted to play. We asked all the little kids AND the big kids. I think like 7 people wanted to play! So, we had enough for TEAMS. We made 2 teams doing bubblegum and did rock-paper-scissors (a hand gesture game

where rock beats scissors, scissors beats paper, and paper beats rock) to see who kicked first. Cuz everyone wants to kick first. Nobody wants to catch. (Rolls her eyes). And my team got to kick first! We all ran to the base to kick and whoever got there first was the first kicker. I was first cuz I'm the fastest. So, I was gonna kick but this little 1st grader started crying cuz she was last. I just didn't want her to cry cuz she's a really tiny one. So, we traded places, and she kicked first."

Natalya describes the ways in which she adapted to make the game work. She chose kickball with her friend, then had to find additional players to join the game. After players were chosen, she decided that bubblegum was the most equitable way to choose teams. She did not end up on a team with her best friend, but "fair is fair," and they both ended up as unofficial captains for their teams. To decide who kicked first, team leaders Natalya and Penelope played one round of rock-paper-scissors, "winner take all," meaning that the winner of rock-paper-scissors would kick first. When teams ran to their places around the bases, which are painted onto the blacktop in the school parking lot, the first to arrive were the first to choose catching locations in the 'field' or were the first to kick behind the home plate (base). Although the rules were created as a team and agreed upon by all players, Natalya adjusted them for her team to make playing more enjoyable for "a little 1st grader." Because Natalya was the team captain, no one challenged her decision. This narrative demonstrates how play allowed Natalya to understand how to play more cooperatively, discuss possible solutions with peers and to act as a leader and make a decision that was equitable for all players.

Changing the rules or players mid-game does not always work. Sometimes students get upset and argue about the rule changes or additional players.

Natalya: “Then Bear, a BIG kid wanted to play (kickball) too. Our team had less players so I thought he should join MY team. But Penelope and Stephen yelled that that wouldn’t be fair cuz he’s a big kid from 6th grade! I said we had the littlest kid on our team, so we should have the biggest kid too! Then Penelope said she was gonna quit – like a BABY. And 2 other kids quit too. So, we put Bear on their team cuz they didn’t have any players left. And cuz he’s big, he DESTROYED us. Like SO bad. But it was still fun cuz he’s funny. He caught all the balls and made us out all the time. (Catching the ball that’s kicked in dodgeball causes the kicker to get an out. Teams are allowed 3 outs before switching who is in the outfield and who kicks). Then cuz they were winning Penelope and Ketan and Stephen all wanted to come back and play on HIS team. We said NO! Too bad. They already quit! Quitters can’t come back!”

Natalya rolls her eyes and huffs loudly in exasperation.

When asked about the disagreement in the game, Natalya simply states that, “quitters don’t get to come back. You quit, you lose. Everybody knows that.” In this game, people who did not want to follow the rules or work together were cast away. They were not allowed back into the game and had to find something else to do. This seemed to be a rule that everyone understood, as all other players (besides the 3 wanting to return to the now winning team), knew this to be the rule for all games.

Natalya: “We were playing another game too. It’s called frisbee. It’s like this circle thing you throw like a flying pancake and it flies all the way to your friend? Do you know frisbee?”

After establishing that I indeed knew what frisbee was, she continued.

Natalya: “I was frisbeeing with Teddy and we were just throwing it back and forth and taking a step back each throw. Like to see if we could throw it far away. So, we were getting super far apart in the grass. Like SUPER far. And I winded up and threw it and it landed on top of the PLAYGROUND! I was like, ‘Ahhhhhh!’ and yelled up to the top to see if Penelope would throw it down. She said ‘yeah’ and that she wanted to play too! So, we had to make a kinda circle. So, I threw it to Teddy, Teddy threw it to Penelope, and Penelope threw it to me! Then ANOTHER kid wanted to play so then Viv made the circle more like a square and I threw it to Mato and Mato threw it to Teddy. It was fun cuz lots of kids wanted to play. And we kept making a bigger and bigger circle until the whole field was a giant frisbee game!”

This example shows how play led Natalya to understand how to play collaboratively and adaptively. She altered her game so that anyone who wanted to play could join. Everyone easily fit into the game without discussion. They continued enlarging their circle to accommodate the new players and compromised the original rules, from playing with 2 players back and forth, to throwing the frisbee around in a circle. This way everyone got a turn to catch and throw. When students dropped the frisbee, the assumption was that they would go to retrieve it. If another student tried to

take the frisbee out of turn, the group reminded them of their place in the game. They worked collaboratively to make this ever-expanding game of frisbee work.

When Natalya plays, she is happy. Even when she's losing, she enjoys the game. She makes alterations and accommodations to the rules to make the game enjoyable for everyone playing. She describes playing as, "the most best part of school. Way better than math." When asked about what she likes or dislikes about playing, Natalya explains.

Natalya: "I just like playing. School isn't my favorite part of school. I just like recess and STEAM and lunch and playtime. The other stuff is like work. You gotta do it, but you don't gotta like it. When I get to play I see my friends and do happy fun stuff. Like running and ball and laughing and the playground. Or foursquare or kickball or basketball or jump rope. I like those things. I like to do outside stuff and inside stuff. Checkers. I'm a BOSS at checkers. I always win cuz my brain likes that game. It just KNOWS how to win. I like to make stuff too. Like when we get to make whatever we want? Like right now? I like that."

Natalya enjoys her freedom. She likes to choose the activities that she's participating in. She has interests inside and outside and appreciates aspects of both. Choices are important, and she likes to switch to different activities throughout the play period. Sometimes she leaves an activity mid-game because of conflict. She does not participate in fighting or yelling. She said that, "that's just too stressful." She dislikes it when there are altercations and leaves to play with other groups.

Natalya: “I just don’t like fighting. Like not my thing. Everyone yelling and stuff. So annoying. I just go somewhere else and play with someone else. Even if it’s my best friend. I’ll just leave her like, bye! (She smiles and waves). Like we were playing checkers and I kept beating her and she got mad. She yelled at me for bragging. And I kinda was but not like BAD. Like dancing and saying ‘I win, I win, na na na boo boo.’ And dancing around the table in a circle, shaking my booty. But it wasn’t MEAN. Just fun. But she was mad and threw the checkers off the table and they flew everywhere! Then she picked some up and threw them AT me. So, I went and played with Teddy. He’s not a bad loser. And SHE had to pick all of them up by herself because she was a bad loser.”

She looks up, thinking. And decides that maybe she was, in fact, bragging. She shrugs it off and says, “oh well.”

When answering if she learns anything while playing, Natalya says, “no. Well, not on purpose.” She admits that sometimes, by accident, she’s learning. “Like I never knew how to play checkers, but Teddy showed me and now I’m the best.” She also remembers when she was playing in STEAM Lab and possibly learned some things by accident while playing.

Natalya: “Remember when we were building that thing? It was a giant cardboard creature? I was trying to cut the fat cardboard with a scissors because it’s the strongest one. And I needed a strong cardboard. But the scissors were too weak! They kept smooshing and bending my project! Then I remembered that we learned how to use

ALL these tools! Like why wasn't I using the saw? Prolly I just forgot! So, I went over to Yogi and Tallulah and they remindered me about all the cardboard tools! Like the saw and the hammer and the screws and the brats (brads). Then I gots those things and went to my spot. The saw is like a little one, but you can't get hurt. But it's a little sharp and I could cut my pieces. Then I used the hammer to poke nails to make hole and stuck the brats (brads) in there. Then it was a HINGE!!! Remember we learned about hinges and levers? So maybe I learned but it was on accident. Wait, I think I learn on accident all the time… Like when I do anything…"

Her eyes light up with this possible epiphany.

This story demonstrates how play enabled Natalya to accidentally learn skills and how she shared her learning and knowledge while playing. She learned to collaborate with peers by creating rules and boundaries for games. She used effective interpersonal skills to mitigate conflict, trying to follow the rules but making it fair for everyone to play. Natalya learned that she needs to step away from conflict to keep herself content. She makes friends through play, changing groups and accommodating younger players, making play fun for everyone around her. Although she didn't really think she was learning when playing, she ultimately decided that she, "prolly was."

Booker

(Self portrait of Booker)

Booker is a thoughtful, intelligent, quirky student. He is 7 years old and in 2nd grade. He loves school, especially science and STEAM classes. Booker loves to play inside as much as he loves being outside. His goal in life is to publish a comic book. He is artistic and creative and enjoys time drawing, writing, and illustrating. His play looks a little different than that of many of his peers. He is an active and playful student, but playtime for Booker can also look more imaginative and internal. He loves talking about his artwork, stories, and imaginative play during interviews. Booker is a thinker and takes his time with his responses to interview questions, and when talking or responding to teachers and peers. For the purpose of this study, Booker is categorized as a thoughtful, quiet, school-loving player who enjoys imaginative play, collaborative play, and playing with words and drawings.

Each interview, Booker calmly walks into the library and sits at the table. He motions for me to come sit across from him. He has brought his notebook, Chromebook, and a book he's been reading and lays them out on the table. Booker's

interviews are around 15-20 minutes in length. He opens his notebook to a page of writing and drawings to signal he is ready to start.

Researcher: “Hi Booker. Are you ready to share some stories with me today?”

Booker: “I think so. Let me check my notebook.”

Booker opens his notebook to the designated page for his new stories.

Booker: “I’ve started a new series – like a cartoon but kinda like a graphic novel too. It’s called Adventures of Pickle Man. See? Here’s the main character – that’s Pickle Man. I started writing this one because I love the new Dog Man and Captain Underpants books and I want to be just like that when I grow up. Me and Mato and Yogi have been writing them together! It’s super fun. Cuz it was raining, and we had indoor playtime, so I got out my notebook and THEY DID TOO!”

Researcher: “Does everyone have a notebook for writing and drawing?”

Booker: “No, but we got extra ones in a drawer we get to use for whatever we want! But I like to make graphic novels and cartoons and stuff. I just like using my imagination to make cool and funny things. And Mato is super funny too, so we make funny stuff. Here, look. See? Pickle Man. He’s going to save the world from the evil Dr. Burger – get it? Because you eat pickles on your BURGER? And here’s Pickle Man’s sidekick – a pickle dog named Dill. Haha. Get it!!? It’s so funny.”

Booker then talks about his friends and their contributions to this collaborative effort.

Booker: “So, me and Mato made the characters and named them. Yogi came over then and joined us. We were all drawing different ways we thought Pickle Man should look. Yogi did the bad guy – Dr. Burger. Me and Mato made Pickle Man and Dill Dog.

Hahaha. Cool, right? So, we're writing the story together but gotta make enough characters first. Here's the other characters. (Points to a few drawings on the page). Those are the main ones, but we need some extra ones, like their friends. And the bad guy needs evil friends too. Like Tomato Ted and Lucy Lettuce? Get it!?!"

I really do get it. This is a different kind of playing. Booker and his co-authors are creating their own world – with their favorite foods as characters. They are creative and entertaining. This kind of play is playing with reality, playing with creativity, playing with imagination. They are collaborating on characters that will be the heroes, villains, and extras in their cartoon style graphic novel. They are working on their characters' names, personalities, and what each should look like. They are cooperating and sharing ideas. When asked about decisions being made about characters and storyline, Booker says, "we all just do it together! It's like a team." This story exhibits how play allowed Booker to understand how to play collaboratively and cooperatively with his peers.

Booker: "Our team needs a name. Like an author name. We can put our names together so we're like one person. Like BookMaGi! Hahaha. That would be perfect. Like Book in the front for me but because we're WRITING a book too! I bet they'll love that."

And they did. When we went back to his classroom that day, his book team decided that that would be the official name of their writing crew – BookMaGi.

Booker: "I talked to the team and we're thinking about making the book in a city so that the bad guys have lots of places to be bad. Like skyscrapers and restaurants and bridges. They can destroy lots of things that way. And there's lots of people so they

can kidnap and do bad stuff. Are we allowed to kidnap when we're writing a story at school? We're not killing people and they won't have real weapons. It'll be like a Ketchup Gun or a Mustard Net."

When those ideas were clarified and approved, Booker continues.

Booker: "We disagreed on one big part though… Everyone wanted a different 'bad' adventure – like robbing a bank or stealing a puppy or painting funny faces on signs and stuff. My idea was the painting one cuz it's pretty funny. Like painting a mustache on a sign for selling houses where the picture is a girl! Or painting cat ears on a crossing street guy sign. Oh, oh! Or what about if the crosswalk was a HOPSCOTCH! That would be SO funny. But not like too bad. But Yogi wants to steal Dill Dog and that's a good idea too but maybe that could be for book 2. I think we gotta make it a fun and silly one for the first book, so people want to READ it. And Mato wants to ROB A BANK! That's illegal! We'd prolly get in trouble for that. No, I think it should be the painting. We can vote maybe."

Booker returns with the results of the vote. Each of the 3 members of their team has voted for their own idea. They decide to ask the rest of the class, individually, if they would like a bank robber, mad painter, or dog thief. The results are a tie.

Booker: "Of COURSE we tied. The two best ideas HAD to tie. Dill Dog and Mad Painter got the SAME votes. 6 for his, 6 for mine. I told them (BookMaGi) that we should do a redo with just the two winner choices. So, we did. But some people wouldn't vote because they still liked the OTHER idea. So, we told everyone to tornado turtle (where students put their heads down, covered with their arms, while curled face down on the

carpet, legs tucked underneath) so they couldn't cheat. No peeking. And guess what? MINE WON! So, we're doing the Mad Painter. I thought it should be called Pickle Man and the Mad Painter. But I didn't tell the guys yet. But maybe something with Dr. Burger. He's the biggest bad guy. He'll be the one making everyone do all the bad guy stuff."

This narrative demonstrates how play enabled Booker to understand how to use a variety of social skills during play, including questioning, discussing, and critically thinking. Booker and his graphic novel team worked together on each aspect of this collaborative project. When they disagreed on a character, setting, or nefarious deed, they discussed ways to come to a solution. In this case it was having their classmates vote on which naughty activity the evil doers should be doing - robbery, graffiti, or theft. Voting within the team proved to be unhelpful as each team member chose their own idea. They were all in agreement that voting with their classmates was the only logical answer, and whatever the outcome, the highest vote would be the winner.

Booker: "We went outside to play and we didn't take our stuff because it was wet and gooey out back and we didn't want to ruin our story. But we played tag and when we were playing tag we talked about what could happen in the story. Like how Dill Dog could save the day and what the Mad Painter could do on signs. Then we ran to the playground cuz our feet were getting soggy. And I told them my ideas and then Mato said we should paint the names on the schools to be funny. Like our school. It could be like Stinktown Elementary School instead of Jamestown Elementary School! (Laughs

uncontrollably). Or Yogi said we could change the college to Peaceville DooDooVersity! Get it? DooDoo? Hahaha."

After a brief break to collect himself and get a drink of water, we continued.

Booker: "But with signs and the little stuff we thought we could be funny too. Like GO signs instead of STOP signs. Painting funny faces on all the signs with people. (Thinks for a little while, looking up at the ceiling). Oh! We could paint wiggly arrows on the straight arrow signs… That would be funny cuz then everyone would have to drive wiggly! There are other ones too. What's another sign? Oh yeah! No biking could be no UNICYLING? Or no smoking is like a little stick? That could be a no magic wand sign! Haha. I'm gonna write that down. Hold on a sec."

Booker runs into his classroom to get a sticky note to add his idea to his notebook.

This playful writing and drawing project was being carefully thought through during all aspects of play. When they played tag, when they were on the playground, during free times in class, and even at recess, Team BookMaGi was considering ideas for their story. This group was quite compatible, but there were still instances of indecision and division that they needed to work through.

Booker: "Remember when we were all fighting? Not like yelling fighting. Well, Mato was yelling fighting. But I don't do that. Only to my sister."

Booker reminded me about the time when BookMaGi had a disagreement surrounding the illustrations in their story. Colors or no colors, that was the question.

Booker: "I like the books like Captain Underpants where there aren't really a lot of colors and the characters are like the stars of the page. Mato likes all the colors and wanted

everything to be super bright. Yogi was kinda in the middle and wanted the characters to be bright but the background to be not colorful. I get that because then the characters stand out but SERIOUSLY. Nobody would listen to me. Mato just yelled and left. Then I was sitting there with Yogi, and we weren't really fighting but he felt bad that Mato left too. So, he left to go get him, but he wouldn't come back. Then I was just by myself so I started drawing in MY OWN notebook the way I thought it should be so I could show them. When they came back right at the end, he saw my drawings and exploded! Then they all yelled at me and left. Mato wouldn't talk to me for like DAYS. Yogi tried to fix it, but I was a little mad that nobody cared about my stuff so then I wasn't talking to THEM. We're ok now, but it was pretty stupid. I just wanted to show them my idea and what it would look like, but everyone thought I stole the book and just did it my way. (Shrugs).

When asked if and/or how they came up with a solution or compromise, Booker said, "I just told them I was making a MODEL not the real thing. Then Mato said HE made a model TOO! Haha. So, we all just traded notebooks to see which was the best. We decided on kinda both, like Yogi said but different. Like the regular story would be less colors and then the fights and exciting parts would be ALL the colors!"

This was the only disagreement that BookMaGi encountered during their writing of Pickle Man and the Mad Painter (their working title). They started with opposing views on how the illustrations should look. Some wanted colorful illustrations, while others wanted more muted tones. This was a change in the rules of this group project. They had agreed to use teamwork and voting to remedy disputes. This change led to a

misunderstanding among all group members. There was some dissent and anger, leading to one member of the group, Mato, abruptly leaving. They didn't speak until Booker decided to show his team that they were upset over something he made as a model, not the real project. They reconciled and continued to work on their graphic novel. This story highlights how play encouraged Booker to negotiate and compromise with his teammates on elements of the story they were creating and how to work through disagreements to play together more cooperatively.

Using his imagination to create alternative realities and sharing them with his peers is Booker's favorite form of play. He carefully chooses who he wants to collaborate with and works closely with his teammates. When there are altercations, Booker uses his mind to come up with creative solutions. He does not participate in conflict, but always tries to assist his peers with diplomatic problem solving. When speaking about play, Booker smiles widely.

Booker: "I just love when we get time to play. It's my favorite. I get to dream up new ideas and draw and write. Even without my notebook, I can still think of all the cool things I want to draw. THEN I get to show my friends and they are usually like, 'Wow, that's so cool! How do you DO that?' And then I'm happy! I really like showing my stuff. Cuz sometimes my ideas are kinda weird. Like Pickle Man? A giant pickle superhero? It's weird but it's SO funny. (Laughs quietly while pointing to the picture of Pickle Man in his notebook). I mean, look? He's hilarious. And he has a baby pickle dog named Dill? Haha. He's so cute. Look at that little face. (Pickle Man and Dill Dog both are pickle

shaped and wearing capes and masks). Playing outside is fun too. But I like using my brain to think of fun stuff. Even when we're playing kickball, I'm dreaming of pickles."

When asked about dislikes during play, the only example that comes up repeatedly is the incident with Booker, Mato and Yogi not speaking to each other because of a misunderstanding. It still bothers Booker that this happened with his friends. He is a loyal and thoughtful friend.

Booker: "I'm still a little sad about that. I really like my friends and I was sad that they thought I was trying to do sneaky mean stuff. I'm not a sneaky mean guy? I'm kinda nice and I think I'm a good friend. I mean, I'm even nice to my SISTER."

Booker was unsure about what he learned during play. After considering the question for a few minutes, he decided that he learned a few things, including how to, "write and draw better and do it with a team." He also learned conflict resolution and how to be a team player. When asked about the future of BookMaGi, Booker says, "I think we'll prolly be famous. We're like super good at drawing and my ideas are crazy so nobody else would think of them. We can live in Chicago in a fancy place and everyone can get their own rooms. Pickle Man will be a whole series with like 20 books. Then we can make another one where the puppy, Dill Dog, would be the main character. Then I'll have to think of another idea because we'll need money to stay in Chicago and eat burgers."

When gently guided back towards the question of learning during play, Booker smiles again.

Booker: “I thought of another thing. I like to play because I’m free. I can do whatever I feel like and I can do it with my friends or by myself. Sometimes I don’t even KNOW everyone else was going inside because I was dreaming of my stories. I think it’s like I feel like I’m IN my stories for real and don’t remember that I’m at school. It’s fun in there. I wish you could see it.”

I wish I could see it too.

(Illustration of Pickle Man and his trusty sidekick Dill Dog)

These individual interviews highlighted 4 students and their experiences in a variety of situations while playing. Their play was freeing, imaginative, exciting, peaceful, silly, braggy, loud, collaborative, fun, explorative, combative, and entertaining. They played alone, in pairs, in small groups, with large groups, and with students in younger or older grades. Play was an experience that brought joy in most instances. In cases of disagreement, compromises and creativity usually brought resolution. Some students preferred playing indoors, while others preferred outdoor play. Imagination, kindness, and cooperation made play accessible for all students, even when discussing Mr. Burger’s plot full of nefarious misdeeds.

Chapter 5: Summative Analysis of Students' Stories

(Illustration of students going on an adventure)

Summative experiences, where students were working, playing, or learning together, were transcribed, coded, and analyzed into final, illustrative accounts. Stories about specific experiences were coded into groups to compare and contrast between individual and group findings. Findings and stories in this chapter are grouped by themed categories, including student discoveries during play; cooperative play; questions being discussed during play; and learning/sharing of information during play.

Discoveries During Play

During my observations students consistently made discoveries during times of play. Whether it was on field trips, during recess, times outdoors, or free time in the classroom, students were discovering. Sometimes they discovered creatures or plants; other times they discovered ideas or the enjoyment of each other.

Nature Center - Bigfoot Tracking

(Illustration of student finding a Bigfoot print)

Students went on a field trip to a local Nature Center where a naturalist and volunteers served as guides. These guides broke students into smaller groups of 8 to 10 students. The group I was with went on an outdoor adventure to hike some of the paths while the guide showed students examples of a variety of plants, insects, and animal scat. While on this hike a student noticed a large depression in the earth in the shape of a footprint. (Context: Before our hike started, we were all gathered into the main building. As we waited for tours to start, students had time to examine taxidermy creatures, look at photos of the natural area and could read through books on footprints, scat, and animals from the area). Students all gathered around the interestingly shaped depression and discussed their hypotheses while waiting for the guide to join.

Conversation:

Penelope: “See, see! Look what I found! Isn’t it awesome?”

Natalie: “No, it’s just a hole. That’s not awesome. Not awesome at all.”

Jack: “That’s not a hole, that’s a TRACK! Do you think it’s a BEAR?!?”

All students scream.

Natalie: “There was a real bear by my house last year! He climbed up a tree and was snoring!”

Penelope: “Bears don’t snore. Wait. Do they?”

Jack: “Yeah they do. I think? Hey, Ms. Steffenie, can I search that on your phone?”

Students gather around Jack and my cell phone as he searches ‘Do bears snore?’ To everyone's amazement, we discovered that they do, in fact, snore. He then asks if he can search up ‘bear footprints,’ and our guide suggests ‘black bear footprints’ as these are the only kind of bear in the state. Jack shows the images to the group, and they decide that this is most definitely not a bear track. Jack’s eyes light up as he has an epiphany.

Jack: “It’s a Bigfoot track! Let’s follow it!”

Penelope: “See, I TOLD you it was awesome. Let’s go find a Bigfoot!”

Natalie: “What if it actually IS a Bigfoot and they chase us. Or EAT us!”

All students scream again.

Guide: (Giggling in the background, considering what to do with this new development). “Well, then, we should probably walk slowly so we don’t startle any creatures. Let’s look for another print to follow.”

All students start searching the area for the mysterious Bigfoot. It had rained earlier in the day, so the ground was soft and a little squishy - leaving many markings for students to check. They search and examine every hole, print and divot. To everyone’s

astonishment, they find another print. This one is a few yards away from the original depression.

Natalie: “Well, I guess they’re real. This proves it.”

Jack: “I TOLD you so.”

Natalie: “I never see’d one before, so I diDn’t know”

Jack: (Smugly) “I see them all the time up north. They’re right by our cabin. They hit stuff on trees to make noise. Like, bang, bang, BANG.” (On each bang, he hit the cattails with a stick he found earlier).

Jack: “They like to hide. They’re like super stealth-mode.”

All students nod in agreement.

After searching for more prints (and finding a few), the guide pulls out a footprint book from his backpack of animals found around the nature center, and hands it to Penelope (because she found the first print). The students gather around their classmate, and ‘oooo’ and ‘ahhh’ at the different pictures of animal prints. They determine that it is not a squirrel, mouse, or vole. After serious examination and discussion, Penelope makes a discovery.

Penelope: “Guys, look. This can’t be a Bigfoot print because it’s too little. Like, it’s a big foot but maybe not like a real Bigfoot.”

Natalie: “Look, it’s kinda smooshed like they were sliding in the mud like us.” (Natalie squishes her boots around in the mud to prove her point).

After looking through each of the photos of footprints in the guidebook, students decide that their print has toes! They count them and see that they’re a little pointy.

Jack: “IT”S A FOOOOOOX!!!!”

Penelope: “A real life fox! That’s as cool as a Bigfoot for sure.”

All students agree - it really is as cool as a Bigfoot. The guide proceeds to tell the group that this particular fox had been hunting and that the slide/squish marks in the wet soil were actually where he pounced on a small rodent like a mouse.

All of the students whisper to each other in excitement about their scientific discovery. (And that they might be famous because of their big find).

In this narrative, discovery learning was occurring in multiple ways. Although we were on a guided ‘tour’ of the nature center, students were given the time and space to discover the natural world on their own. Walking along the nature trail; picking up sticks and leaves; looking at insects and birds as they flew or crawled by; and finding exciting footprints in the dirt are all examples of the discoveries being made while on this adventure. Students took agency in their learning by exploring and using resources to answer their questions (asking to borrow a cellphone to use as a resource for finding information on the mystery footprint).

Flower Braids

(Illustration of a student on the playground after running from nefarious bees and butterflies when picking flowers)

Students were given extra recess one afternoon as a reward. It was a sunny spring day with flowers blooming and bees buzzing. Students headed to the playground area, where there are also fields, a garden, trees and picnic tables. One student decided to pick a few clovers from the grassy space. A few others joined in. After they had a bunch of clovers (maybe 15-20 flowers) they asked the leader of the flower gathering activity (same class) to show them her newly learned skill.

Eily: (Walks over wearing a crown of flowers on her head).

Twyla: “Woahhh. Where’d you get that!!? Can I have it?”

Eily: “No! It’s mine. I just made it. My friend showed me.”

Twyla: “I’m your friend. Can I make one?”

Eily: “Easy peasy. You just do this.” (Eily proceeds to show Twyla how to braid the stems of long clovers and dandelions together to make a chain).

Twyla: “Definitely NOT easy or peasy.” (Her chain repeatedly breaks apart).

Eily: “No, no, no. Like this.” (Slowly shows her the braiding technique again). “You need like those super long ones.”

Enter 3 more students to join the braiding party.

Charlie: “Ooooo. I want one.”

Twyla: “You have to MAKE one. Like this. It’s easy peasy.” (Shows the newly learned braiding technique to Charlie and the other 2 students).

Charlie: “Lemon squeezy!” (Proceeds to tie knots into the stems instead).

A bee and butterfly appear simultaneously.

Charlie: “Ahhhh!!!! We’re under attack!!!!” (Runs away screaming).

Eily: “Run for your life!!! Head to the castle (playground)!” (Joins Charlie running away screaming).

Twyla: “It’s JUST a BUG.” (Stays seated in the grass braiding her flowers together, rolling her eyes at her classmates).

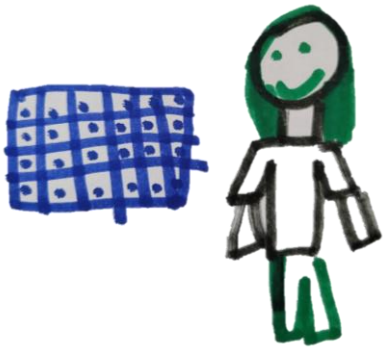
All students leave Twyla to fend for herself against the buggy duo while ripping apart their crowns and throwing the flowers at the nefarious bugs. They proceeded to the castle (playground) where they ran to the top and yelled ‘bombs away’ while tossing flowers from the top of the tower at imaginary bugs attacking the castle.

As the whistle blows, Twyla skips into the school proudly wearing a flower crown made with her newly acquired skill.

This example of discovery learning shows students teaching each other a skill - braiding or weaving flowers together. Eily took the lead, as she was the only student who knew how to braid. She taught Twyla this skill, who then passed on the knowledge

to Charlie and the other 2 students. Although the method of joining flowers together changed as each student adapted the method to fit their knowledge base, they all discovered a way to 'braid' during this extended outdoor free time. Students discovered a variety of plants in our field – some with long stems, some had flowers, a few had leaves and all were green! They learned about elasticity (how flexible certain kinds of stems were) and rigidity (stems that broke when bent or braided). They also discovered that bees and butterflies aren't really that terrifying but make for great villains in their games.

School Garden



(Illustration of planting seeds for the school garden)

Our students won a grant to start an outdoor community garden. They discussed what kinds of plants we should grow, studied companion planting, and learned about pollination. Students decided on tomatoes, zucchini, mixed greens, cucumbers, herbs and a variety of flowers. Letters were written by students to seed local companies to see if they would be willing to donate seeds or seed starting materials. Students

learned about growing seasons (length of time for plants to produce) and zones, measuring planting spaces (height and width), and how to compost. A bucket for collecting compost was placed in the cafeteria to collect vegetarian scraps (no dairy or meat) and students went to each classroom to train others in proper composting etiquette. Seeds were started in windows, plants started to grow.

Miao was interviewed during the construction of the garden, after seeds were planted and compost knowledge was disbursed.

Me: “Tell me about the school garden.”

Miao: “Omgeeee! Ms. Steffenie! It is SO cool. My seeds are growing. Like, a bunch. They’re even getting LEAVES. I planted peas and zucchini and tomatoes and leaves. But, like, eating leaves. Like lettuce. WE CAN USE THEM FOR LUNCH!!!”

Me: “What happens next?”

Miao: “We grow them bigger and bigger until they can go outside. But not ‘til it’s warm or they'll die. That would be bad and we’d have to start over again. Then we can dig holes and put in the compost but only at the bottom.”

Miao shows with her hands how the digging works and pats the table after her imaginary plants have been planted.

Me: “Why just on the bottom?

Miao: “Because. Because the plants get hurt from the compost if it goes on the top. They don’t like it.”

(Miao is explaining that fertilizer could burn the plants if they put it on the plants themselves - that it only goes around the plants or in the hole under the roots.)

Me: “What have you learned from the garden project?”

Miao: “I learned lots of stuff. Like, how to grow plants and that you definitely can NOT grow a banana in [our state]. Cuz we have snow and that kills lots of stuff like bananas. You gotta check the ZONE. And we gots a cold one. So no bananas. But yes tomatoes and stuff. And compost helps the earth have the good stuff. Like it doesn’t go to the trash heap, so it saves the world. And, Ms. Steffenie, (long pause) you know what? Chickeny Doo Doo (the organic chicken poop fertilizer used in our gardens) is THE GROSSEST THING EVER. No, really. It’s super stink. I almost died it was so stinky. Like this.”

Miao keels over out of her chair, pretend gasping for breath, holding her heart… Peeking out from her closed eyes to make sure I was watching.

Discovery learning was illustrated in Miao’s interview in a variety of ways. Miao enthusiastically explained everything she learned about plants, gardening, and compost. She gave detailed descriptions of growing plants and taught others about how to properly plant seeds in windowsills and what kinds of uneaten foods can go into the compost. Students discovered that warm weather plants could not survive in the cold temperatures of our region because of zones and that our zone is too cold for tropical plants including bananas. They discovered that compost heats up when it’s decomposing because of microbes (good bugs) in the soil that are breaking down our food waste, and that we need to mix it up to keep it from getting too hot. Students found that you can grow an abundance of vegetables in a small space (but not quite enough for everyone at school to eat during lunch). They discovered the importance of

less food waste (through compost and the donation of extra produce) and taught classmates about only taking the food you're sure you can eat – and that you can always get seconds). Most importantly, students discovered that chicken poop fertilizer (placed in the hole where we were planting – not on the plant itself), although an excellent source of nutrients for plants, is 'super stink.'

Discovery learning occurs when students are given the freedom to explore. These narratives describe just a few examples of the excitement students had when learning through play and discovery. They learned about various plants and animals; reduced waste through compost and gardening; taught newly acquired skills/knowledge to each other; and employed a variety of learning techniques; all while exploring and discovering their world through play.

Cooperative Play

While observing students during play, there were many occurrences of cooperative play. Sometimes students started playing alone or with a partner, but as their play grew, so did the number of students who wanted to participate. Through cooperative play, students learned to work together, created parameters for play, worked through problems collaboratively, and expanded their play collectively.

House? No, Post Office!

(Illustration of students playing house)

Students had to play indoors because the weather was too cold to be outside. A pair of students chose the stand area (similar to a wooden lemonade stand – no decorations at this time). They started to discuss what it should look like and what they could turn the space into. In this area is a box of dress-up clothes, kitchen supplies, dolls, blankets, and carriers (baskets, wraps, carts, etc.). Next to the stand is the writing center, with various papers, coloring pages, envelopes, stickers, and writing utensils. They decided that they were going to play house. One would be the parent; one would be the baby.

Tallulah: "Ok. You be the dad and I'll be the baby. I can wear this." (Puts on a little hat from the dress-up bin).

Brecken: "No. I'M the baby. You can be the mommy."

Tallulah: "That's not fun. I don't want to be the grown up."

Brecken: "No, I don't want to be the grown up. They're boring!"

Tallulah: "Well, I'm gonna be the baby."

Brecken: “Then I’M gonna be a puppy!” (Proceeds to crawl around on the floor barking and licking things).

Tallulah: “Then you gotta wear this cuz puppies wear collars.” (Brings a blue bandana to Brecken to wear).

They tie the bandana around Brecken’s neck and continue to play ‘house’ as baby and puppy, both crawling around the play space. Another student, Frankie, brings a piece of paper he’s written on to Brecken – not realizing that he is a puppy.

Brecken: “Bark, bark!” (Takes the paper from Frankie, holding it in his teeth).

Frankie: “Nooo! What are you doing to my paper?”

Brecken: “Just holding it. Ruff!”

Frankie: “In your MOUTH?”

Brecken: "Yeah, cuz I’m a puppy!”

Tallulah: “Is it a letter? We can mail it!”

Frankie: “Let me get the envelope! Then we can send it to Mexico.”

Frankie brings an envelope and some markers from the writing center. He starts writing words and drawing on the envelope.

Frankie: “Ok! It’s ready to mail!”

Tallulah: “Who are we sending it to?” (Gets in the window of the stand, acting as mail carrier – taking off the baby hat).

Frankie: “I’m sending it to my grandma in Mexico. See? I drew the place.” (Drawing includes a tiny grandma at her house and a flag with red, green and white STRIPES).

Tallulah: “Ok. That’ll be 15 dollars.” (Puts her hand out for money to mail the letter).

Frankie: “I don’t have money!”

Brecken: “Here, I have some. We need a stamp.” (Gives Tallulah some pretend money that is invisible).

Tallulah: “Here you go, sir.” (Stamps the letter with her hand in a fist, then draws a little squiggle in the corner. Then she hands back some of the invisible money).

Tallulah places the letter in a bag she’s found in the dress-up bin, then tells Frankie and Brecken to make some more mail so she can deliver them. They comply, adding pictures, addresses and people to each folded paper and envelope. Tallulah then walks around the room in a mail hat she’s found (baseball cap) and delivers letters to the desks and lockers of students in their class while yelling, ‘Mail!’

This instance of cooperative play involved two students who decided to play ‘house.’ After initially disagreeing on who would play adult or child, they eventually agreed on characters and roles. They welcomed new players to their game – even when the new additions didn’t know what the game was. They collaboratively changed the game from ‘house’ to post office without discussion. Players welcomed the switch and seamlessly switched roles from baby to mail carrier, and puppy to mail helper/maker. This kind of cooperative group play, where students changed and adapted the play to fit what was happening around them, was observed regularly throughout this study. Sometimes it was ‘house,’ or post office, other times it was school, bank, or grocery store.

Legos & Robot Attack

(Illustration of students programming an Ozobot)

There was one giant box of Legos on a shelf. One student took the box to the carpet and decided that they were going to make a whole city out of Legos. They started alone, with one tiny house and a tree. Soon, another student asked if they could play. Eventually, it evolved into a multiple house neighborhood with almost the entire class cooperating.

Yogi: “Here we go!” (Dumps entire bucket of Legos on the floor).

Yogi gets a few of the flat bases out of the Lego pile and starts collecting only yellow Legos for his top secret build.

Apu: “What are you making?”

Yogi: “It’s a secret. But it’s gonna be so awesome.”

Apu: “I can help! I’m gonna make a tower like thiiiiiiis tall.” (Raises hand over her head while standing up on tip toes).

Yogi: “Well, I’m making my house. Then I can make YOUR house! What color is yours?”

Viv: “Can I play?”

Yogi: “No because we’re not playing. But you can come build stuff.”

Viv: “Ok! I’mma build a boat with a guy driving super fast.” (Finds a blue flat base and a little Lego person to drive his future boat. Viv also grabs a brown hat for his Lego person).

Apu: “Ooooo… I need a person for my house too!”

Yogi: “I thought you were building a tower?”

Apu: “Yeah, I am! It’s a tower house! I’ll put this guy on top.”

Ketan: “What are you building? Can I make something?”

Viv: “Yeah! Come make a part of the town! I’m making a boat, Apu has a tower and Yogi is making houses! That one’s mine!” (Points to the blue Lego house being constructed. Then shows off the other two houses).

As the construction continues, more students are added to the building crew. The cooperative city building team decides that they need a giant piece of paper to put the city on.

Apu: “Let’s get that paper and see if Ollie wants to draw! He’s a good draw-er.”

Viv: “Hey, Ol! Come check out the town! You should draw the streets cuz we can’t drive the boat if we don’t have streets.”

Yogi: “Yeah, we can make the streets WATER!”

Ketan: “Then we could swim to school!”

Yogi: “Ok. I’ll make a school real quick.”

More students enter the build and illustration. The carpet is filled with little colorful buildings, Lego people, towers, waterways and a boat. Lu enters the scene, observing from above. She has an idea but is hesitant to share with the group.

Viv: “Hey, Lu, wanna play?”

Lu: “No, I’ll just watch.”

Viv: “Come sit by me. You can share my boat.”

Lu: “What if the boat was a robot boat!”

Viv: “Let’s get the bots!”

They unplug a few Ozobots. This kind of mini robot runs by tracing marker lines or by Coding. They start drawing thick lines through the riverways on the large paper underneath the Legos for the Ozobots to follow.

Lu: “Ready??? This is going to be EPIC.”

Viv: “Let’s do it! Ready, set… GO!”

Ketan: “Here they come!”

Apu: “Quick! Move your hands!”

Yogi: “Duh duh. Duh duh.” (Starts the ‘Jaws’ theme song. Everyone joins in).

The Ozobots wind their way through the city, until one goes rogue.

Viv: “We’re under attack!”

Lu: “It’s like Godzilla! Run!”

Students start giggling, then laughing hysterically. The Ozobots have started running through the city, off trail, and are now ramming houses and towers. Houses are being moved into the waterways, towers are tipped, and the boat is pushed right off the map.

Tiny Lego people are being picked up by students, each grabbing one or two. They pretend the Lego people are running, by moving them around on the paper away from the Ozobots, while making strangled screaming sounds.

This cooperative play activity shows the power of teamwork. One student started with an idea, then players and ideas were added. These ideas morphed into a team building something together, with each student adding their own unique perspectives. A student was asked to join the play because of their expertise with a skill – in this case, drawing. Students brought this project together with each adding their Legos builds to the large drawing in the center of the floor. The 3 dimensional city had houses, buildings, roads, towers, a boat, trees and tiny people. Then Ozobots were added to the scene. When the destruction started, nobody was upset because they had all worked on this project as a team and chose to laugh at the chaos as a team.

Leprechaun Traps

(Illustration of a student building a leprechaun trap)

In March, students are ready for leprechauns (small fairy-like beings dressed in green) to make an appearance in their classrooms. Sometimes leprechauns play tricks on students, by moving chairs and papers, or dyeing things green (milk, snacks, toilets). One day, the entire class decided that those pesky leprechauns needed to be trapped and put into time-out. It did not go as planned.

Chooch: “Bro! We gotta catch those guys before they mess stuff up!”

Jack: “Yeah. They always mess up our room! I’ll get the stuff.”

All students agree that traps are necessary for catching a leprechaun. They collect materials from the Makerspace area, including paper, cardboard, scissors, glue, glitter, pom poms, pipe cleaners and anything else they could fit in their arms. Students naturally form groups based on compatibility and design of trap. They switch groups if they feel like they would work better elsewhere.

Chooch: “Cooool! I’m gonna use that big box. Let me get the cutter.”

Jack: “I’ll get the glue and tape.”

Penelope: "Oooo. I’m taking that glitter! Leprechauns LOVE glitter and gold.”

Eily: “Yeah, we’re gonna use ALL that glitter. Get the glue!”

Chooch: “Ok, ok, ok. See, if he comes in here, then he’ll go down this slide (a paper towel roll) and into this trap of gold!”

Jack: “Yeah, yeah! Then he’ll be stuck in the glue! A gluey swimming pool of stuck!”

Chooch: “He’ll never get out.”

Penelope: “Ours too! He’ll get lured by the glitter cuz he’ll think it’s gold. Then he can walk on this (tape line, sticky side up) and get stuck! Then he’s gonna try to get out and he’ll be like, ‘No!!!! I’m stuck here,’ then when he tries to run he gonna get stuck over here and here and over here!”

Eily: “We’ll get leprechaun gold! Then we can let him free.”

Chooch: “We can’t let him free! Then he’ll trick us! He might steal our homework!”

Jack: “But where are we putting him? Like a cage house? Like the cockroaches?” (One classroom has class pets - giant cockroaches).

Eily: “But then he’ll be sad! Or he could DIE! They need rainbows or else…”

Penelope: “Got it. I’m making 5 rainbows then. All different colors. Then he’ll be happy and give us his gold! And we can be lucky.”

Chooch: “Fine. We WON’T keep him. But can we just talk to him for a little while? Then give him some rainbows with glitter?”

Jack: “Good. Then we’ll get good lucks. We can share the lucks. And golds.”

They continue building traps around the classroom, in places that they feel would be good for leprechauns – by the window, on the table near the door, and with yarn crisscrossing an area in the corner of the classroom.

In this cooperative learning experience, students chose an activity to do together – in this case building leprechaun traps. They picked people they wanted to collaborate with and projects that they wanted to participate in, moving between groups to help or add their expertise (including glitter and rainbows). Students discussed the purpose of the traps, how to trick the leprechaun, the benefits of glitter, rainbows and gold, and finally decided that they wouldn’t keep or hurt the leprechaun – they just wanted to catch him and share some luck. They had a disagreement, worked through that disagreement cooperatively, then agreed on the final goal of the project.

Cooperative learning is a beneficial learning tool for students. It allows students to work through disagreements, work together to create something collaborative, encourages teamwork, and inspires group creativity. Giving space for students to

cooperate can motivate students to participate with peers that they might not have otherwise chosen.

Discussing & Questioning

When participating in play, students question and discuss issues that arise during exploration and investigation. Providing open-ended questions and new experiences allows students to grasp concepts more easily. They are encouraged to play with ideas, question outcomes, discuss objectives/findings, and reflect on the learning process. Giving students the time to experience new material through play encourages deeper thought processes and more in-depth learning. An example of this process is seen in the building of snow forts described below.

Building Snow Forts

(Illustration of how a student had to crawl through the snow fort tunnels)

When it snows while students are at school, they are energized and ready for outdoor play. On this day, it snowed 3 feet and the snow plow had piled snow in the corner of our playground area into 5-12 foot mountains. As students ran outside, they

screamed with excitement at the new adventures they would be having in these gigantic snow mounds. Students joined one of three groups that had formed on the mound.

Ben: “Look at this SNOW MOUNTAIN! Let’s get up to the top so no one else can have it!”

Stephen: “I’m first cuz I’m the fastest. Come on!”

Ben and Stephen climb the snow mountain in coats, snowpants, mittens, and boots – which makes progress much slower than they thought. And they have competition.

Andrea: “Haha. I’m first.”

Stephen glares at her from below. Josh is on Andrea’s team and laughs with Andrea.

Josh: “Na-na-na-boo-boo! You can’t catch us!”

Ben: “Hahaha.” (Laughs and runs down the snow mountain).

Teddy: “Come make a fort with me! Look at this hole!”

Andrea, Stephen, Ben and Josh gather around the giant hole left from the plow in the center of the snow mountain.

Ben: “Yeah, I’ll get the shovel!”

Stephen: “We can have a tunnel this way. Look!” (Points to the left of the snow mountain where there is a natural crack in the snow).

Andrea and Teddy start digging into the hole with their mittens. Ben brings a stick (shovel) to break apart the larger snow balls. Stephen and Josh start creating the tunnel.

Teddy: “Look at how big it is! We can all fit in here now! Come here!”

Andrea: “We could have a secret meeting in here where no one would know!”

Stephen: “Yeah! Let’s do that next recess. But don’t tell anyone!”

Ben: “Yea, cuz it’s a secret!”

Josh: “And look! We can fit a little more here. Like 2 people! Where should the tunnel go? Maybe we can make a secret tunnel all the way back to school!”

Teddy: “Like under GROUND!”

Andrea: “Nobody would see us go back to school! That would be so funny! They’d think we got lost and poof! We’d be back in school.”

They all keep digging to make the tunnel. Teddy realizes that some of the larger snow chunks are moving as they dig underneath.

Teddy: “Look out! That one’s moving!”

Andrea: “Avalanche!”

Teddy: “What in the world? Why!?!” (A section of the tunnel collapses).

Andrea: “Must be a Yeti. They like making snow problems.”

Ben: “No! It’s the hole! It’s breaking the whole thing!”

Stephen: “Guys, look! If we take all the snow from the bottom (underneath) the chunks are falling! See? Ahhhhh!!!!” (A large snow ball falls near Stephen and Teddy).

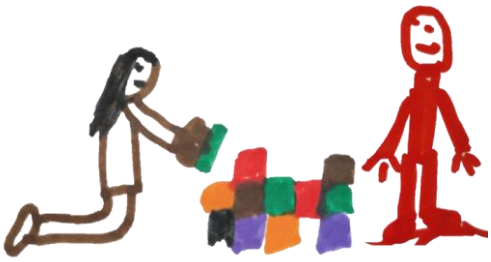
Ben: “Ok, ok, ok… We gotta fix it. Ok. Let’s put that piece back on here, then we can smoosh the snow in there and make it stay.” (Ben fills the gap under the snow ball with fists full of wet snow. It fills the space and Teddy adds more snow to make it extra secure).

The team starts to fill all empty spaces under snow balls to make sure the fort and tunnel won’t collapse. Ben and Teddy lead the group in strengthening the fort. Andrea, Stephen, and Josh keep carefully digging tunnels and making the interior of the fort

larger. The bell rings and everyone runs to line up, promising to continue work next recess.

This example of discussing and questioning shows students collaborating on an idea (building a snow fort) then working through problems together. When a portion of the fort/tunnel collapsed, one student became frustrated. Another student questioned what happened and why it was happening. The third member of this team tried to figure out a solution to the problem. Each student played an important role as they worked together, discussing what had happened, why it was happening, and how to proceed to create a safe tunnel that wouldn't collapse as they dug through the snow. They worked together to create a plan of action and design a better fort.

Makerspace



(Illustration of students Making)

In my classroom there is an area designated for making – a Makerspace. In this space there are tools (screwdrivers, hammers, cardboard saws, drills, large sewing needles, etc.), connectors (string, nails, screws, brads, glue, tape, etc.), and other building and making materials (cloth, cardboard, paper, yarn, hooks, play dough, paper

tubes, beads, boxes of various sizes, wood, etc.). During making times students are given time to create. They have been taught how to use all materials and tools safely. These times are free from constraints and allow students time for creativity.

Natalie: “Wanna sit by me? I’m making a robot!”

Penelope: “Cool! I can make one too! Can I have that box?” (Grabs a cereal box).

Natalie: “Yep. Here. How do I stick this head on here?”

Natalie and Penelope cut pieces of boxes into various shapes for their robots using mini cardboard saws and scissors.

Penelope: “Well, I’m gonna use screws and those little metal thingys with legs (brads) cuz I tried the tape last time and all the pieces fell off.”

Natalie: “But why’d they fall off? This tape is sticky!” (Sticks finger on and off the tape).

Penelope: “I dunno? Maybe cuz this (cardboard) has colors and shiny stuff on it? It’s like it’s slippery, see?” (Penelope slides her hand across the shiny cardboard).

Natalie: “That’s more slippy than the other boxes. I’ll try those too.” (Points to the screws and brads that Penelope had brought to the table).

Natalie: “But I don’t know how they go.”

Penelope: “I got it. Like this. You poke a hole with this (small screwdriver) and then stick it in. Then take the legs and push them out. Now it moves! Like a real robot!”

Natalie: “Coooool! Let me try!” (Pokes multiple holes for brads, flips them over, and pushes the legs apart, making a joint).

Natalie: “Wow! Look! Now he’s walking! Doo, doo, ddoo, ddoo!” (Robot walking music).

Penelope adds brads to her robot joints where the arms and legs hook to the body of her robot. Natalie does the same, only her robot has 3 legs. They add googly eyes and draw faces on their robots. Their robots then go on a trip around the classroom, complete with walking (and dancing) music.

In the discussion between these 2 students, one student discusses her uncertainty with creating a project. She is unsure about how to build, which tools to use, and if it will work. A classmate talks to her about the tools she has on the table and why she chose each for this specific project. They discussed why certain items could work better than others and drew on prior knowledge to create projects that were more successful than the ones they had previously designed. They worked together, discussing and questioning, until their robots were made and working. Then they paraded around the room to show off their masterpieces.

Coding Robots

(Illustration of a student Coding)

Students learn coding to program our robots (Ozobots and Spheros) to perform certain tasks. Coding for younger students or students who are just learning how to

code includes a kind of programming called Blockly. Blockly is a kind of drag and drop coding where students 'snap' together different blocks in a specific order to make something happen. They could put a right arrow block with an up arrow block 5 times to make the robot move to the right and forward – like it's moving up a staircase but sideways. During a free coding period, students chose to create a maze out of Legos for their robots to move through.

Teddy: "I gots the Legos. Let's build something super awesome."

Mato: "Ok. I think it should be like a maze but with traps where you might get stuck if you mess up."

Teddy: "Let's do the big blocks so it can be taller. Then it'll be good."

Mato: "I got all the blues. You do all the yellows."

Teddy: "No way. I'm doing the reds. Red is like Bucky Badger and waaaay better than yellow."

Viv: "I'll do the yellows. I like that color. Yellows like a sunny flower!"

The three students build their maze in color sections – one red, one blue, and one yellow. Eventually, they run out of their chosen color blocks and band together in multicolored glory.

Teddy: "I'm gonna get the robots ready. They are gonna crash for sure…"

Mato: "They won't crash! We can code them away from the traps! No crashing over here!"

They program the robot together, ‘snapping’ blocks together and assessing where they think the robot will go. But they can’t seem to remember how far each step will take their robot.

Viv: “Ok. Let’s test it. Ready?”

Teddy and Mato agree that they’re ready.

The robot instantly turns and crashes into the wall of the maze.

Teddy: “Oh no!!! That’s the worst. He only took ONE STEP and died!”

Mato: “Told you so. I knew we were doomed.”

Viv: “No way! We got this. We just messed up his steps. He needs to go 3 forwards THEN turn. We only did 1 forward and he turned and crashed.”

Teddy: “Let me fix it. Ok… 3 forwards… 1 turn. Is that this way or this way?” (He points left then right).

Viv: “THIS way. That’s right. Look, see? Look at your hands. When you put ‘em like this, (out if front, palms away, fingers pointing upwards), then you make like an ‘L’ with your gun fingers. See this one? Like an ‘L’ that means left. The other one is backwards so that has to be right cuz it’s not an ‘L.’”

The boys all put their hands out in front, making the ‘L’ and backwards ‘L’ with their pointer fingers and thumbs (gun fingers). They don’t look convinced that this is the real way to know left from right but try it out anyway.

Teddy: “Got the code! I added more steps so we could get more into the maze.”

Viv: “Ok, here we go!”

The robot makes its way through the maze. They have added about 10 steps and the robot goes straight, turns right, goes straight a few more steps, then crashed into a different maze wall. The group cheers with excitement that the robot made it further through their maze. They continue adding blocks to their code, and changing some of the maze traps, so that their robot can move through the maze more easily.

This example of discussing and questioning includes three students conversing about Legos and coding robots. They communicate about which colors and blocks should be used to create the maze. They agree and disagree but design a Lego maze collaboratively and colorfully, nonetheless. When coding, their robot is programmed incorrectly and the group questions why the robot crashed and what they can do to remedy the situation. They are taught a trick, by Viv, for learning directions – which way is left or right – using their hands as guides. This trick is questioned, but in the end, used to their advantage. The discussion and questions lead to a successfully coded starting route for the robot, and a new skill shared with peers.

Shared Learning (& Information Sharing)

Observations of students sharing learning and information occurred numerous times during this play study. Shared learning occurs when students are excited about learning. This can happen during exploration, when learning about something new, or when learning through experiences. It is always collaborative. Students share knowledge and information in a variety of ways including verbally, digitally, and visually.

The Toe Biter

(Illustration of the Goo Monster)

Our students went on a field trip to a local Natural Area. This Natural Area has guides and naturalists who take students on adventures throughout the protected space. Areas include a meadow, swamp, woodland, and pond. The students in my group ended our time in nature at the pond. This pond is very tiny, with a wooden pier and platform for viewing wildlife and conducting scientific exploration. Students were given nets, buckets, and small dishes for use with the microscope. Students were dressed for soggy conditions in raincoats and boots. They were instructed to scoop their nets into the muddy shallows to see if they could find any small insects, fish, or microscopic goo.

Jack: “I’m gonna get a BIG scoop of goo.” (Dips net into the mud).

Natalie: “Ewwww! It’s slimy!”

Violet: “Bring me the goo so we can look in that machine (microscope).”

Jack: “Uh… We gots a problem…”

Violet: “EW!!! IT’S MOVING!”

The guide explains to the students that it might look like it's moving a little because of the little bugs and microscopic organisms. This was NOT what was causing the movement.

Jack: "I don't think so. There's something IN THERE!"

Natalie: "IT'S ALIVE!" (Puts her hands on her cheeks in horror).

Chooch: "Woah! You caught a sea monster!"

Violet: "No, no, no. This is too scary. What's in there?"

Jack: "I got it. I'm not scared!" (Dumps the wiggling goo onto the petri dish).

Jack: "Uh, guys? There's a real THING in here…" (Looking into the microscope).

Other students have shown various microscopic creatures to the group with the guide asking students to identify the organisms from a laminated chart they've broughT with THE GROUP. At least 6 different creatures have been identified. Everyone is eager to see what else has been caught.

Students surround the petri dish to see what's in this new goo when we hear a collective SCREAM.

Chooch: "Oh no! Oh no! What IS THAT!!!!?"

A wiggling muddy blob jumps out of the dish and onto the table. The guide laughs.

Jack: "Alien!!! It's an alien from space! Look at it's legs!"

The guide takes some of the pond water and washes off the unknown creature. Violet screams again.

Jack: "Ms. Steffenie! That's NOT on the list! I think it's a bug?"

Penelope: "Can I check your phone? We can find it on Google!"

I open Google and hand over my cell phone. Students watch the screen intently.

Penelope: “What do I search? Like big scary pond bug?”

Chooch: “Add the color!”

Jack: “I think those are wings? Do water bugs have wings??”

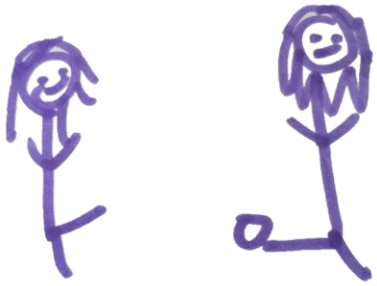
The decide on location, size, color, and that it has wings and come to a surprising discovery.

Penelope: “Hahahaha. It’s called a TOE BITER!”

The group bursts into laughter as Penelope reads the name and characteristics of the giant water bug called the toe biter. This water bug swims and flies, and sometimes pinches the toes of swimmers that get too close.

This is an exciting example of shared learning. Students started this activity ready to learn and explore. They scooped pond water and mud from the shallows and off the pier. They were actively engaged from the start and became increasingly excited as they found and identified more and more creatures. Students in this group learned about a vast array of water organisms and identified them together. They shared knowledge and an excitement for learning. The mystery creature from the goo engaged students and encouraged them to gather even more information. They learned about toe biters and the other organisms from in and around the pond. Students were learning together and sharing knowledge without even realizing it.

Ice Skating & Sledding on Ice



(Illustration of student putting on ice skates)

Every student in our school earned a fun day outdoors in the winter – this means snow, ice, and cold temperatures. Students were able to snowshoe, sled, or ice skate at a nearby park. We transported the equipment that was borrowed from families, neighbors, and the city's park service. Students chose one initial activity, then switched activities throughout the afternoon.

Patty: "Come on! Let's do skating first."

Marimar: "Uh… I don't know how to skate."

Patty: "I'll teach you! We can use that little pusher thingy over there. Just hold on and walk! But we gotta put the fat socks on."

Marimar: "What are the fat socks?"

Patty: "So your feet don't get painful. You know those little owie circles (blisters).

Marimar: "Oh geez… I don't think I can do that. Look at everyone falling!"

Students who are skating are now starting to get on the ice. Some are falling and laughing, others are skating circles around their peers, a few can't stand up and are

crawling in skates across the frozen pond. Patty shows Marimar how to put her skates on and has a teacher tighten both of their skates.

Marimar: “Oh no, oh geez, oh no, uh oh…” (Stands up and walks wobbly onto the ice).

Patty: “Woooo! This is great! Grab that thingy!” (Skates over to Marimar with a device that looks like a walker on skiis).

Patty: “Ok. Here. Hold this. Now walk in little baby steps. Yeah!”

Marimar holds tightly to the walker while carefully moving her feet.

Marimar: “Ahhh. Ohhh! WAHHH!” (Falls on the ice after 2 wiggly steps).

Marimar: “This is the worst. I hate this.”

Patty: “No! You got it. We can do it together. See?” (Stands in the walker with Marimar and pushes off one skate, gliding and pulling Marimar along with her).

Marimar: “Just don’t go fast! This is kinda fun!”

Patty skates while pushing the walker with Marimar inside. Marimar doesn’t move her feet but is happy to be going for a ride.

Patty: “Weeeee! Here we go!”

Patty skates faster and pushes the walker away from her while letting go. Marimar squeals and laughs as she goes speeding down the ice. Patty skates up next to her with a sled that she has procured – with a student inside.

Anastasia: “Go super speed, Patty! Wooooo!”

Patty: “Hey Miramar! Get in here!”

Marimar abandons the walker and happily jumps in the sled with Anastasia.

Marimar: “Now we can go super speed!”

Patty skates as fast as she can while pulling the sled. She spins around in a move called 'crack the whip,' where the sled spins in a circle, she lets go, and the momentum of the spin launches the sled away from her. They all laugh and enjoy the ride.

Patty: "Wait up! You guys are going too fast! Haha."

Marimar: "Quick aim the sled! We're going to hit the snow!"

The sled plows into a snow bank and covers Marimar and Anastasia with a dusting of fluffy snow.

Patty: "Hahaha! You guys have BEARDS! Now you look like a grandpa!"

Marimar looks at Anastasia and giggles uncontrollably. They have white hair and faces from the snow. Everyone is laughing. The group decides to try to skate again, this time without the walker.

Anastasia: "Hold my hand. Now hold Patty's hand too. Ready? We'll go slow."

Marimar grabs the hands of her friends and slowly gets up on her skates.

Patty: "See! Just walk with a slide. Like push a tiny bit, then you go forward."

Marimar: "You could just pull me."

Anastasia: "Then you won't get how to skate! Here. Like this." (Pushes with her left skate, glides, puts her feet together. Then pushes with her right skate, glides, puts her feet together).

Marimar: "Like this? Woahhhhh. Ok, ok, ok. Push, glide… Push, glide… Ahhh!"

Marimar falls, but this time takes out her friends in the process. They all lay on the ice laughing and throwing snow at each other.

This afternoon of adventure is a learning experience for everyone. While Patty and Anastasia have both been skating before, they choose to share information and knowledge with Marimar who has never done this before. They work together to come up with solutions, ideas, and different ways to teach Marimar tricks for skating. Teaching methods are adapted, and the students learn from each other. They come up with alternatives to skating by using a walker and a sled. While learning together, sharing information, and teaching each other, they are still having fun and enjoying the activity and each other. In this example, shared learning happened organically between friends. They were excited and motivated to share their knowledge so that another of their friends could learn and play.

Rube Goldberg

(Illustration of student whistling while building a Rube Goldberg machine)

Students designed and created a Rube Goldberg machine using found objects and items and tools from the Makerspace area. They decided that there should be at least 5 reactions before the final challenge of watering a plant. This was a whole class

project with everyone participating and adding their ideas and mechanisms to the machine.

Eily: “Since we’re trying to water that plant, I think we should do the whole project backwards. Then we won’t kill the plant by accident.”

Apu: “Why would the plant die??”

Eily: “Cuz we might accidentally land a giant thing on it. Like the ball or that box.”

Twyla: “Then it would be squished and dead.”

Miao: “Don’t kill the plant! Let’s do backwards.”

Eily: “Here. Take this (ball). We should make a ramp hit the ball into the watering can.”

Twyla: “Let’s do the ramp with those rolls. We can cut ‘em up like this.” (Shows cutting the cardboard paper towel rolls in half).

Miao: “We can tape them like this. Then make a waterslide for the plant water after the ball hits the can.”

Apu: “But the first thing has to be the highest or the water won’t go down the slide. Maybe they can start up there with a piece and we can meet them backwards over here.”

Patty: “Guys! Start your part over there so we don’t kill the plant!”

Teddy: “You got it, boss!”

The class breaks into teams naturally and start working on sections of the Rube Goldberg machine. One group to start, one group in the middle, and one group at the end, protecting the plant.

Teddy: “We gotta start up here so that the marble can roll down and hit these bricks.

(Teddy stands on a table in the corner of the room and holds up a tall, thin box).

Mato: “But what makes it start? Like how is the marble going down that thing?”

Ketan: “Cuz I’m gonna push it! I’ll be the starter!”

Teddy: “But then gravity pushes it to the earth and the marble can keep going by itself.”

Viv: “Yep. Like when we fall over cuz gravity is not always good.”

Ketan: “But we’d float away! Gravity isn’t bad!”

Viv: “It is if you fall.”

Patty: “No. Falling is your fault. You didn’t treat gravity right.”

There’s a big crash (gravity) and the entire final section falls to the floor. The students change gears to help fix the fallen pieces and connect the three sections together. The sections consist of a pool ball hitting Jenga blocks, Jenga blocks tipping like dominoes into a marble, the marble going down a ramp made from old car tracks, the marble hitting a big ball, the big ball knocking over the water bucket, and water pouring down the tunnel of paper towel rolls into the plant on the floor.

Patty: “This is gonna be GREAT! Gravity for the WIN!”

Ketan: “Ready? Set? GO!” (He pushes the ball towards the blocks).

Chaos erupts as every piece of the machine hits every other part of the machine in a chain reaction, except that this chain reaction happens simultaneously instead of one section at a time.

Viv: “Told you gravity was evil.”

The Rube Golberg machine was an exercise in shared learning. Students had to share information – about gravity, height, angle, domino effect and plant safety. Different students knew information helpful to the project and shared it with their classmates. One shared information on the angles and height of the machine, explaining that height would serve as the source of momentum for the reactions to be successful. Another thought using gravity to their advantage would be helpful, pulling the marbles and pool balls downward. These are important concepts being discussed and shared, although some of the official terminology and depth of concepts are still being worked through. Sharing learning and information sharing is important for student growth and thought processes. They think about what peers are sharing, and work through it themselves. Then they decide which information is valuable, and what they consider unimportant. (Although a consensus on gravity still hasn't been reached.)

Students in this study played and learned together. They made discoveries during play; cooperated while exploring and playing; asked questions and discussed issues that arose while playing with concepts and ideas; and shared information and prior knowledge during play. These categories of play, discovered during observations through coding, are important for student learning and understanding.

Chapter 6: Guiding Principles of Practice & Application of Findings

(Illustration of everyone's favorite pup, Super Tallulah)

Observations

By using narrative inquiry and autoethnography to study the importance of play in schools, I answered my research question: How do children in 2nd/3rd grade classrooms in a mid-sized city experience play during the school day? These findings were described in detail in chapters 4 and 5. Some significant observations from this research study include students participating in imaginative play; exploration and discoveries made during play; the social skills acquired while playing; and behavioral differences because of play.

Observation 1: Imagination

My research showed that time for play is vital to students using their imaginations. When given time to play, students were more likely to create an activity or game where their imaginations were used. Sometimes they created alternative versions

of games where players were animals, such as playing house where the parents, babysitters, and babies were puppies; or tag, where all of the players were animals from the area – bears, foxes, birds, cranes, frogs, or bunnies. When on field trips with their peers, they imagined that there was a Bigfoot roaming the swamps and went searching for footprints and listening for Bigfoot calls; and founds mysterious goo creatures that bit the toes of unsuspecting swimmers. On the playground, students pretended that the woodchips underneath were lava and they had to jump from surface to surface, monkey bar to slide, tunnel to swing. When learning to braid flowers together as crowns, butterflies turned into dangerous fire-breathing dragons, bees into nefarious monsters looking for their next victim. When writing stories with their friends, they imagined Super Pickles with capes and trusty pickle-dog sidekicks that saved the world from the incredibly evil Bad Guy Burger.

Students need time to imagine. It allows students to process their thoughts and ideas. They "move in different worlds, different space/time structures, including the imaginary worlds they are forming, the ongoing social worlds within which they are acting, and the wider world of experiences that they are drawing upon (Dyson, 1988, p. 3). Play gives students the time and space to create imaginary worlds, creatures, and structures. This ability to create gives students the freedom to explore their world and make discoveries for themselves.

Observation 2: Exploration and Discovery

Play gives students the opportunity to explore and discover. Sometimes this occurs on their own, other times with partners or groups. Students can discover and explore ideas, concepts, or wonderings while reading (and learning) together. They discover both real and imaginary creatures such as animals, bugs, flowers, leaves, tree sap, and footprints on field trips. Sometimes discoveries are made cooperatively, in a muddy area, where a Bigfoot turns into a hunting fox. Or a new insect could be discovered in a pond, covered in goo, that pinches swimmer's toes. When exploring a new area outdoors, the sound of a pterodactyl screeching could turn out to be a local pair of sandhill cranes choosing a place to nest. Exploring the Makerspace area in the STEAM Lab might lead to discovering new items to build and create with – giving students ideas for making instruments from cardboard, string, rubber bands and tape. They can learn how to start seedlings, grow and transplant baby plants, use organic fertilizer and teach their schoolmates how to compost effectively through discovery of planting zones and trial and error with compostable materials, temperatures, and times.

John Dewey stated, "give the pupils something to do, not something to learn, and the doing is of such a nature as to demand thinking, or the intentional noting of connections, learning naturally results" (1916, p. 191). Students learn important content by doing. Through play, they experience and discover their world. They explore ideas and build on these ideas with their peers. Working together, they build knowledge. Sometimes this knowledge turns into play-based student-led projects or research.

Students take agency in their own learning, researching their ideas or questions, because they are of interest and/or importance to them.

Observation 3: Social Skills

Students learn important skills through cooperative and collaborative play. They gain an understanding of how to work with their peers, working through disagreements and misunderstandings. When students are allowed to work through their problems, they come up with creative solutions to their differences in opinion. This can look like an older student taking the time to notice a younger student's unhappiness when playing, and making accommodations to ensure that the younger student has a turn to play. It can be loud, where students are arguing and upset with each other. When given the time to work through this cooperatively, students usually find a solution – or decide to play something or somewhere else. Sometimes students create new games or ways to play together, such as a game of house turning into a post office to accommodate additional players, and a change in the rules of the game. Collaboratively, students can play and discover – acquiring new knowledge – like the field trip to the nature center where a Bigfoot print was discovered and explored, and found to be the print of a pouncing fox. Or when an entire group discovered a goo monster, that, when researched, turned out to be an insect that swam and flew (and bit toes). In both instances, students bounced ideas and hypotheses off each other and determined

possible species, including Bigfoots, bears or foxes; or flying fish, aliens or Belostomatidae (the Giant Waterbug), also known as the Toe Biter.

Students need to play, to explore their worlds, and to discover new things together. Playing cooperatively gives students the space needed to question and learn collaboratively. Learning from group experiences empowers students to learn from and with each other. “To 'learn from experience’ is to make a backward and forward connection between what we do to things and what we enjoy or suffer from things in consequence. Under such conditions, doing becomes a trying; an experiment with the world to find out what it is like; the… discovery of the connection of things” (Dewey, 1916, p. 89). Playing together teaches students how to cooperatively live and function in society. They recognize the importance of collaboration and teamwork. This leads to a better understanding of each other, their world, and the expectations of being a person in this world.

Observation 4: Behaviors

Something else interesting occurred when students were given times to play during the school day – behaviors changed. Students that typically struggle with classwork or just being at school realized that maybe school wasn’t so bad after all. They started interacting with their peers, working on projects/learning together, were more likely to actively participate in class, and challenging behaviors started to decrease. The longer students engaged in this study, the more these difficult behaviors

disappeared, or at least lessened. Problematic behaviors seen at the beginning of this study included not participating in activities, “blurting” (speaking over teachers or peers), not keeping their bodies to themselves (touching, hitting, poking, etc.), and general disruptions. Some of these were attention seeking behaviors, while others are out of insecurity, frustration, or boredom.

When students with behavioral challenges were allowed to play every day at school, some were unsure how to use this newfound freedom. A few wandered from play area to play area, group to group. Once they found activities they were interested in, or groups that enthusiastically accepted them into their play, their behaviors during play quickly and drastically changed. They shared their ideas with peers, asked questions, cooperated, collaborated, imagined, explored, discovered, and actively participated in play. Those that were still a little uncertain if they were playing correctly (they had not been exposed to this kind of learning before) took a little longer joining groups, participating in activities, or creating something to do. But they persisted and eventually all students looked forward to play times in school and during school activities (field trips). Students started treating each other more respectfully and used social cues more effectively. They cooperated and worked through disagreements and compromise. Students shared learning and experiences. They feel a stronger connection to their classroom and the school because they were given times to play. “Our classrooms, at all levels, must look more like happy families and secure homes, the kind in which all family members can tell their private stories, knowing they will be listened to with affection and respect” (Paley, 1990, p. 147). And students in this study

really felt like a family. Sometimes they fought, argued, or disagreed, other times they compromised, cooperated, and loved. They felt more secure with themselves and their peers because they had played together.

Implications

As the examples show through individual interviews and observations of students at play in chapters 4 and 5, categories including student discoveries during play, cooperative and collaborative play, questions, and discussions occurring during play, and how shared learning experiences were observed, recorded, transcribed, and analyzed for play periods given to 2nd and 3rd graders at Jamestown School. These play times were important to building numerous skills including interpersonal skills, negotiations, socio-emotional skills, problem solving, critical thinking, leadership, adaptability, creative thinking, kindness, empathy, decision making, curiosity, and learning by doing, to name a few.

Discovery learning and exploration gave students the freedom to explore their worlds and discover new ideas. Students explored the natural world while on field trips and during outdoor play times. They discovered and created new worlds while using their imaginations while writing comic books and building with Legos. They learned about the relationship between animals, plants, dirt, compost, and seeds to create a successful school garden to teach their peers about healthy eating and donated extra produce to those in need in our neighborhood. They explored new ways of learning and

discovered that they enjoyed taking agency in their own learning. Discovery learning and exploration encouraged students to think creatively and critically. They learned to adapt their ideas based on the facts discovered. Discovery learning and exploratory experiences are important aspects of learning and play for students.

Cooperation and collaboration allowed students to work together in their learning. They played together, worked together, and worked through disagreements together. They learned to participate as members of a group or team. Students cooperated on projects, explorations, and discoveries; respected other students' viewpoints, positively added to group activities, and shared their expertise or questions with the group. They practiced cooperation when faced with dilemmas while playing games with multiple players, or when a classmate almost fell into the "swamp" (and was lifted out by peers). Cooperation was also observed during team games, where new players joined mid-game, or when teams were in disagreement with each other and there was a need for leaders to mediate heated situations. Collaboration occurred during indoor playtimes when students were building, programming robots, or creating stories together. This was observed during outdoor adventures when students built on each other's knowledge to decide if there was a Bigfoot on the loose in a local nature center, or if the Goo Monster seen jumping out of the petri dish at the pond could be identified as a real creature, instead of something imaginary. Cooperation and collaboration during play periods inspired students to work together productively, and work through issues constructively. Students adapted play to meet the needs of their peers and learned to work as teams. Cooperative and collaborative learning and play

are important pieces of the educational puzzle and are necessary for building healthy student relationships with peers.

Asking questions and having discussions is another important category of play while students are at school. When students are given the space to ask questions about ideas, concepts, findings, or are questioning everything around them, they learn authentically because these are genuine questions happening in real time. Discussing a variety of possible answers engages students with the content. There may be a 'right' answer, but allowing students to explore the possibilities on their own lets them actively participate in how they learn and play. On our outdoor adventures, questions arose about possible creatures that were making the footprints found on the trail and in the mud, with discussion among students about size, shape, pointiness of a footprint, and how far apart the footprints were that they had found. When slide trails were found in the mud along the edge of the swamp, discussions occurred regarding whether this was an insect, waterfowl, amphibian, or reptile. Students with prior knowledge shared information on footprints or slides that they had seen, habitat of the potential creatures causing the tracks/slides, and their hypotheses on if the creature in question lived in our area (or could possibly have traveled there). At school, during playtime, students would question the rules of a game to decide if they were equitable, then discuss solutions and optional rule changes to make the game more "fair". Discussions about what students should play were also commonplace during this study. Students learned ways to ask questions of their peers in ways that were positive. They played with possible answers and solutions to questions. They discussed and debated ideas thoughtfully

and thoroughly. Skills learned through questioning and discussions during play at school included critical thinking, teamwork, emotional control, more confidence in public speaking, and how to structure thoughts and share ideas in clear ways.

During this study, shared learning was happening every time students were given the opportunity to play INSIDE, outside, on adventures; in groups, IN pairs, or solo. Students were sharing knowledge and sharing experiences while learning new things. Even when playing alone, students found ways to share their learning with peers. Sometimes this happened right away, and they would excitedly find a friend to share with. Other times, they would wait until they were inside or in class to share their insights. When students were learning something together where one student (or more) had prior knowledge, they would share what they already knew with their groups, then other members of that group would move on to share their newly acquired knowledge with their peers. When learning something new together, there was usually one leader with the necessary information, that would show or share with their groups. Sometimes when all students were trying to learn something new simultaneously, they would, through the process of elimination, figure out everything that did not work, eventually coming up with a solution. Every so often there would be an epiphany, where one or more students would happen upon the answer at the same time. This kind of shared learning happened less often, usually occurring when on an adventure. An example would be when we went to a nearby stream to watch certain kinds of large fish jump over a small dam. Students were questioning and discussing possible reasons for this behavior. They were working together to explore the area and discover the answer.

They cooperated with each other and finally decided on asking a local angler. They whooped with delight when they simultaneously learned something together, then shared their learning with the rest of the class. The fish were moving from river to lake to find a partner. Students learned new facts, skills, ways to play, how to find answers, and where to find information from shared learning experiences during play.

This research study and findings contribute to educational practice and policy by advocating for the reshaping of what a classroom could look like for students and educators. By allowing and encouraging play during the school day for all students, much needed time for exploration, collaboration, discovery, and idea sharing will occur. Advocating for play in schools could create a more equitable educational system, where students are the focus instead of standardization of education. Innovative ways to teach through play could change what being a student or teacher means. Teaching with play and allowing students playtimes at school would create a classroom environment where students are the focus, and learning is an enjoyable experience. Rote memorization and standardization of education would be a thing of the past. Sitting at a desk being taught by lecture and a worksheet would be no more. Play and student-centered learning would take their place.

The implications of this study are clear – students need time to play at school.

Creating an Environment Conducive to Play

What do these findings mean and is this kind of classroom or research replicable for educators?

This section describes my classroom environment and milieu, how this research came to fruition, and how this style of teaching and learning is accessible to all educators. I created a classroom environment that suits my needs and the needs of my students. I built open spaces into my classroom and utilized the outdoors when possible. For this kind of learning to work, adaptability, not being fearful of failure or 're-do's,' loving to play (with and without your students), and the ability to laugh at yourself (and with your students) are helpful traits. Patience, and a sense of adventure (and humor) are the only requirements for a productive (and entertaining) play-based learning environment.

Storytime…

As an educator and researcher, I straddle the world of teaching and academia, weaving storytelling and play into experiences for school aged children (3-14 years old) and college students alike. I teach and learn through play and noticed that students in my classes were making noticeable educational gains, scoring higher on assessments (including standardized assessment), and learning more deeply about concepts/topics - all with fewer interruptions and behavioral challenges. These epiphanies in the

classroom lead me to graduate school, 2 Masters of Science degrees, 8 Teaching and Administrative Licenses, a teaching award, and eventually to my research questions for this dissertation: How do children in 2nd/3rd grade classrooms in a mid-sized city experience play during the school day?

My classroom is an active space. It is play-based, project-based, and student-centered. There are tables, desks, boxes, and carpets; seating is flexible, with balls, chairs, stools, and the floor. Students work where they are most comfortable. When the weather permits, we move our learning outdoors. Exploration, adventures, and field trips are common - sometimes in our neighborhood, other times we take walks or buses to exciting locations. Students are expected to explore their own ideas - programming robots, researching topics of interest, flying drones, creating digital art, building with Makerspace materials, coding digital games, thinking critically, and actively playing.

When students are excited to learn, it can be loud! This style of learning through play requires collaboration, discussion, cooperation, disagreements, conflict-resolution, and sometimes, the need to walk away from a project. This means that the classroom can be noisy with students sharing ideas, arguing over the best ways to solve a problem, and switching between groups. Play is not always a quiet, sit-on-your-carpet-square situation. Students in my classroom are on the move, or in their chosen spaces for flexible seating. They are excited about learning (both what they think they are going to learn and what they've actually learned), adventures, and exploring - and want to share that excitement with their peers.

We build what we do together. These are students that have (mostly) been in my classes from 3k (3 year old preschool) through 8th grade (around 14 years old). Together, my students and I have created a space where learning is tailored to each student. They collaborate, pitch ideas to each other, explore, create, explore, try new things, positively fail (meaning failure without negative consequences or connotations), share, and play.

Is this kind of play-based educational experience replicable or applicable?

My classroom milieu is one that's been created together. At the beginning of each school year, students and I discuss our purpose – why we are doing what we're doing – and create a list of classroom expectations. This is done collaboratively. The 'why' usually has something to do with learning, exploring, trying new things, working cooperatively, etc. Students come up with ideas, and I share our thoughts. Together we create a list of non-negotiables (behaviors or attitudes that are always acceptable), and ways to fix our community if someone chooses to break those agreements. These usually include rules about kindness, cooperation, agency, respect, seating, body awareness, participation, effort, critical thinking, problem solving, and adaptability. Ways to rebuild a broken community are called community service. In my classroom that means apologies, fixing items around the classroom, cleaning up messes (figurative and literal), coming up with creative solutions, and others. These are very similar from class to class, with younger students having more simplified ideas and older students having more specific and detailed thoughts.

Having had these students for multiple years is extraordinarily helpful to this process. Some of these students have been in my class from 3 years old through 14 years old. This setup allows students to be more comfortable because they already understand the expectations and together, we build an even stronger classroom community than the previous year's. Most students come to class the first week knowing that we will be building on our progress and learning from the previous year. They come to class with ideas to help enhance the classroom experience for themselves and their classmates. This is the groundwork that builds our classroom culture.

Students in this research study started their year with a cooperatively created list of classroom expectations. For this group, there were 8 guidelines. This included kindness towards each other and the teacher; no yelling (unless there's an emergency); cleaning up your own messes (with supplies and peers); talking is allowed, as long as it's kind and not interrupting directions; share your ideas and learning (including findings and discoveries); you can always change groups, you just can't change groups because you're angry; and keep your equipment safe and in your own area (specifically robotics, Legos, drones, Makerspace). We then chose what we thought would be fair consequences for not following these class guidelines. This list included washing tables, mediation with the peers (if the offense was student vs. student), writing/drawing an apology note, sweeping, or whole class meditation (when all students need a break).

Although learning goals are required and standards-based, our class meets these in a variety of different and playful ways. Exploration, discovery, and questioning lead students to projects or learning that they find important. An example would be making a slideshow in Google Slides. I teach the necessary skills and guide students through the various tools for creating a slideshow. They learn how to make a new slideshow, add slides, and delete slides; add links, photos, and video; change backgrounds or themes; design transitions; and share their work. The rest of the project is based on student interest – they have free reign over the topic (with some previously created rules in place, including school appropriate topics). My job is to teach students how to use the tools, then allow them to create something individual and amazing. I don't have to tell students exactly what to do because I've created an invisible hand to guide them from the start of each project or new topic. Projects are open-ended and student driven. Another example would be engineering simple machines and putting them together as a whole class Rube Golberg Machine. Students each had their own piece of the project to create and complete but with guidelines in place to make sure that each piece had 3 engineering components – levers, pulleys, or ramps. The rest of the creation was up to the students. Again, this activity involved meeting the standards, meeting my students' needs, while allowing them to play with ideas and concepts to make this piece their own. Sometimes the play in my classroom is loosely guided play where I guide students by giving them the knowledge and tools needed to complete a project. This freedom and intention is met with excitement and enthusiasm.

But conditions are not uniform, and meeting the needs of students in other spaces will not necessarily look the same as in my classroom. Students need scaffolding, guidance, and structure when beginning something new and innovative. Some students have not experienced open-ended learning and will struggle with having so much freedom. My suggestion, based on how this all started in my classroom, is to start with smaller projects, where students have a little freedom to explore. Model how to start creating or thinking by talking through your own thought processes. When starting the Makerspace in my classroom, I showed students how each area, tool, and material worked. I encouraged students to try each tool before embarking on a project. Together, we used screwdrivers, hammers, nails, and screws; poked holes, screwed cardboard together, hammered nails, and added yarn. After scaffolding how to put items together in a Makerspace to create something new, we created musical instruments. Designing a musical instrument was the assignment, but engineering sound using yarn, rubber bands, cardboard and tape was the underlying standard. Some students designed instruments based on real instruments they had seen or explored. Others created instruments from their imagination because they were more comfortable with a less structured environment.

We return to the question of whether or not this kind of play-based educational experience is replicable or applicable. I believe it is, but I also think that it's not a one-size-fits-all kind of program. A play, play-based, project-based, and student-centered classroom needs to fit the style and needs of the teacher as well as the students. It should be adapted and altered for each classroom and student population. Students

need a gentle invisible hand guiding them through how to play at school. Once they feel comfortable with play, they will start to discover, explore, cooperate, collaborate, question, discuss; share their learning, findings, and interests; and truly enjoy learning at school. All students should be allowed to play during the school day, we just need to explore and identify ways for this to work for teachers, too.

This study showed the need for play in our schools. Students are learning many important skills during play. When students are given time to play, they are learning to design, cooperate, discover, collaborate, explore, question, create, problem-solve, adapt, discuss, lead, make decisions, communicate, think critically, and use their imaginations, among numerous others.

Conclusion

When students are allowed to play, amazing things happen. Students share stories, explore concepts, create relationships, build communities, and learn. "Children learn the way we all learn: through engagement, and through construction. They have to make sense of the world, and that's what play or any other symbolic activity does for children" (Dyson, 2009, p. 1). Students need a sense of their own agency, "their own capacity and an ability to ask questions and solve problems. So we have to give them more open-ended activities that allow them the space they need to make sense of things" (Dyson, 2009, p. 1). Continued research and observation of children at play is of utmost importance. By analyzing observations, interviews, and videos of students

during unstructured periods of play, this study could encourage schools, districts, and policymakers to add unstructured periods of play for all elementary aged students.

(Illustration of Ms. Steffenie & Tallulah)

References

Abdi, A. (2014). The Effect of Inquiry-Based Learning Method on Students' Academic Achievement in Science Course. *Universal Journal of Educational Research*, 2(1), 37-41.

American Montessori Society (2021). What is Montessori? *AMS.* https://amshq.org/About-Montessori/What-Is-Montessori

Ashiabi, G. S. (2007). Play in the preschool classroom: Its socioemotional significance and the teacher's role in play. *Early Childhood Education Journal*, 35, 199–207.

Barros, R. M., Silver, E. J., & Stein, R. E. (2009). School recess and group classroom behavior. *Pediatrics,* 123(2), 431–436. https://pubmed.ncbi.nlm.nih.gov/19171606/

Bilewicz-Kuźnia, B. (2016). Places, toys and activities observed in the course of children's free play in preschool. *New Educational Review,* 44(1), 257–269.

Bransford, J. D., Brown, A. L. & Cocking, R. R. (Eds.) (2000). *How people learn: Brain, mind, and school*. Washington: National Academy Press.

Bruner, J., Jolly, A., & Sylva, K. (Eds.). (1976). *Play: Its role in evolution and development*. New York: Basic Books.

CDC and SHAPE America—Society of Health and Physical Educators. (2017). *Strategies for Recess in Schools.* Atlanta, GA: Centers for Disease Control and Prevention, US Dept of Health and Human Services. https://www.cdc.gov/healthyschools/physicalactivity/pdf/Recess_All_Students.pdf

Connelly, F. M., & Clandinin, D. J. (1990). Stories of experience and narrative inquiry. *Educational Researcher*, 19 (5), 2-14.

Cossentino, J. (2006). Big Work: Goodness, Vocation, and Engagement in the Montessori Method. *Curriculum Inquiry*, 36(1), 63-92.

Council on School Health. The Crucial Role of Recess in School. *Pediatrics,* Jan 2013, 131(1) 183-188. https://pediatrics.aappublications.org/content/pediatrics/131/1/183.full.pdf

Creswell, J.W. (2007). *Qualitative Inquiry and Research Design*. Thousand Oaks, California: Sage Publications, Inc.

Crotty, M. (1998). *Foundations of Social Research: Meaning and Perspective in the Research Process*. Thousand Oaks: Sage Publications.

Denzin, K. & Lincoln, Y. (1994). *Handbook of Qualitative Research*. Sage Publications, Inc.

Dewey, J. (1915). *The School and Society*. The University of Chicago Press.

Dewey, J. (1916). *Democracy and education: an introduction to the philosophy of education*. Free Press.

Dewey, John. (1897). My pedagogic creed. *The School Journal,* 54(3), 77-80.

Dyson, A. H. (1981). *A case study examination of the role of oral language in the writing processes of kindergarteners* (Doctoral dissertation, University of Texas, 1981). Dissertation Abstracts International, 47, 2001.

Dyson, A. H. (1988). *Drawing, talking and writing: rethinking writing development*. U.S. Dept. of Education, Office of Educational Research and Improvement, Educational Resources Information Center [Washington, DC].

Dyson, A. H. (1997). *Writing superheroes: Contemporary childhood, popular culture, and classroom literacy*. New York: Teachers College Press.

Dyson, A. H. (2003). *The brothers and sisters learn to write: Popular literacies in childhood and school cultures*. New York: Teachers College Press.

Dyson, A. H. (2009). *All work and no play makes for a troubling trend in early education*. Science News. https://news.illinois.edu/view/6367/206065

Dyson, A. H. (2018). *Composing childhood cultures: Ethnography upside down*. In N. Kucirkova, J. Rowsell, & G. Falloon (Eds.), A Routledge International handbook of playing and learning with technology in early childhood. Abingdon, England: Routledge.

Dyson, A. H. (2018). A Sense of Belonging: Writing (Righting) Inclusion and Equity in a Child's Transition to School. *Research in the Teaching of English,* 52(3), 236-261.

Edelson, D., Gordin, D., & Pea, R. (1999). Addressing the Challenges of Inquiry-Based Learning Through Technology and Curriculum Design. *Journal of the Learning Sciences*, 8(3-4), 391-450.

Fröbel, F. (1826) *On the Education of Man (Die Menschenerziehung)*. Keilhau/Leipzig: Wienbrach.

Graue, M. E., & Walsh, D. J. (1998). *Studying children in context: Theories, methods, and ethics*. SAGE Publications, Incorporated.

Gray, P. (2011). The Decline of Play and the Rise of Psychopathology in Children and Adolescents. *American Journal of Play*, 3(4), 443-463.

Gray, P. (2018). *Evolutionary Functions of Play Practice, Resilience, Innovation, and Cooperation*. In P. K. Smith and J. Roopnarine (Eds.), The Cambridge Handbook of Play: Developmental and Disciplinary Perspectives. Cambridge, UK: Cambridge University Press. (p.84-102).

Hyvonen, T. P. (2011). Play in the School Context? The Perspectives of Finnish Teachers. *Australian Journal of Teacher Education*, 36(8), 49-67. https://ro.ecu.edu.au/cgi/viewcontent.cgi?article=1645&context=ajte

Hillman, C., Pontifex, M., Castelli, D., Khan, N., Raine, L., Scudder, M., Drollette, E., Moore, R., Wu, C., Kamijo, K. (2014). Effects of the FITKids randomized controlled trial on executive control and brain function. *Pediatrics*,134(4). https://pubmed.ncbi.nlm.nih.gov/25266425/

Holson, L. (2019, February 28) States Consider Longer School Recess, and the Adults Aren't Complaining. *New York Times*. https://www.nytimes.com/2019/02/28/nyregion/longer-school-recess-connecticut.html?fbclid=IwAR39h0T8grlsmjeKq4ISD_p99LPrRIRVKS-TTSG_gYPd9HApGHptyYQ0bA4

Holt, N. L., Lee, H., Millar, C. A., & Spence, J. C. (2015). Eyes on where children play: A retrospective study of active free play. *Children's Geographies*, 13, 73–88.

Huizinga, J. (1970). *Homo Ludens: A Study of the Play Element in Culture*. London: Maurice Temple Smith Ltd.

Kolb, D. A. (1976). *The Learning Style Inventory: Technical Manual*. Boston, MA: McBer.

Kolb, D.A. (1981). Learning styles and disciplinary differences, in: A.W. Chickering (Ed.) *The Modern American College* (232–255). San Francisco, LA: Jossey-Bass.

Kolb, D. A. (1984). *Experiential learning: Experience as the source of learning and development* (Vol. 1). Englewood Cliffs, NJ: Prentice-Hall.

Kolb, D. A., & Fry, R. (1975). Toward an applied theory of experiential learning. In C. Cooper (Ed.), *Studies of group process* (33–57). New York: Wiley.

Kolb, D. A., Rubin, I. M., & McIntyre, J. M. (1984). *Organizational psychology: readings on human behavior in organizations*. Englewood Cliffs, NJ: Prentice-Hall.

Lindqvist, G. (2001). When small children play: How adults dramatise and children create meaning. *Early Years,* 21, 7–14.

Link, J. (2019, March 18). Recess is Making a Comeback: Now Required by Law in Five States. Goric. https://goric.com/recess-is-making-a-comeback-now-required-by-law-in-five-states/#:~:text=At%20least%20five%20states%20now,wish%20to%20allocate%20that%20time.

Maclean, N. (1976). A river runs through it and other stories. Chicago: University of Chicago Press.

McKean, E. (2005). *The new Oxford American dictionary*. New York, N.Y: Oxford University Press.

McMurrer, J. (2007). NCLB Year 5: Choices, Changes and Challenges: Curriculum and Instruction in the NCLB Era. *Center on Educational Policy*. https://www.cepdc.org/displayDocument.cfm?DocumentID=312

Montessori, M. (1964). *The Montessori method*. New York: Schocken Books.

Nicolopoulou A., Barbosa de Sá, A., Ilgaz H. & Brockmeyer, C. (2009). Using the Transformative Power of Play to Educate Hearts and Minds: From Vygotsky to Vivian Paley and Beyond. *Mind, Culture, and Activity*. 17(1), 42-58.

Paley, V. (1990). *The Boy Who Would Be a Helicopter: The Uses of Storytelling in the Classroom*. Cambridge, MA: Harvard University Press.

Paley, V. (2004). *A child's work: The importance of fantasy play.* Chicago: University of Chicago Press.

Paley, V. (2009a). *A Child's Work: The Importance of Fantasy Play*. Chicago: University of Chicago Press.

Paley, V. (2009b). The Importance of Fantasy, Fairness, and Friendship in Children's Play. *American Journal of Play,* Fall 2009, 121-138.

Paley, V. (2011). A Conversation with Vivian Gussin Paley. *Young Children,* 90-93. http://hello.naeyc.org/HigherLogic/System/DownloadDocumentFile.ashx?DocumentFileKey=120ab5ac-0efc-481f-a589-1ffda889c08a

Panasan, M., & Nuangchalerm, P. (2010). Learning Outcomes of Project-Based and Inquiry-Based Learning Activities. *Journal of Social Sciences*, 6(2), 252-255. https://files.eric.ed.gov/fulltext/ED509723.pdf

Parker, C. (2015). School recess offers benefits to student well-being. *Stanford Educator Reports*. https://news.stanford.edu/2015/02/11/recess-benefits-school-021115/

Reilly, K. (2017, October). Is Recess Important for Kids or a Waste of Time? Here's What the Research Says. *Time*. https://time.com/4982061/recess-benefits-research-debate/

Roussou, M. (2004). Learning by Doing and Learning Through Play: An Exploration of Interactivity in Virtual Environments for Children. *ACM Computers in Entertainment*, 2(1), 1-23.

Saldaña, J. (2016). The coding manual for qualitative researchers. Thousand Oaks, CA: Sage Publications.

Society of Health and Physical Education & American Heart Association. (2016). *Shape of a Nation*. https://www.shapeamerica.org//advocacy/son/2016/upload/Shape-of-the-Nation-2016_web.pdf

Shammas, B. (2019). Time to Play: More State Laws Require Recess. Unstructured playtime is making a comeback in schools as frustrated teachers, parents, and advocacy groups demand legislative action. *George Lucas Educational Foundation*, 3(7). https://www.edutopia.org/article/time-play-more-state-laws-require-recess

Sutton-Smith, B. (1997). The ambiguity of play. Cambridge, MA: Harvard University Press.

Terada, Y. (2018, March 9). Research-Tested Benefits of Breaks: Students are easily distracted, but regular, short breaks can help them focus, increase their productivity, and reduce their stress. *George Lucas Educational Foundation*. https://www.edutopia.org/article/research-tested-benefits-breaks

United Nations Human Rights Office of the High Commissioner. (1990). *Convention on the Rights of the Child*. https://www.ohchr.org/en/professionalinterest/pages/crc.aspx

Van Oers, B., & Duijkers, D. (2013). Teaching in a play-based curriculum: Theory, practice and evidence of developmental education for young children. *Journal of Curriculum Studies*, 45, 511–534.

Vygotsky, L. S. (1967). Play and Its Role in the Mental Development of the Child, *Soviet Psychology*, 5(3), 6-18.

Vygotsky, L. (1978/1995). *Mind in society: The development higher psychological processes*. (M. Cole, V. John-Steiner, S. Scribner, & E. Souberman, Eds., and Trans.). Cambridge, MA: Harvard University Press.

Vygotsky, L. S. (1981). *The development of higher forms of attention in childhood*. In J. V. Wertsch (Ed.), The concept of activity in Soviet psychology (189–240). Armonk, NY: Sharpe.

Weisberg, D. S., Hirsh-Pasek, K., & Golinkoff, R. M. (2013). Guided play: Where curricular goals meet a playful pedagogy. *Mind, Brain, and Education*, 7, 104-112.

Appendix A: Interview Protocols

Interview Questions for Students:

1. Tell me about the game/activity you were playing.
2. How did you decide who would play which roles?
3. Tell me about how you worked through or solved the disagreement or misunderstanding during your game.
4. How did you decide who was allowed to play this game?
5. Who decided on the participants?
6. Could anybody play with you?
7. What did you enjoy about your time to play?
8. Was there anything you did not like about playing today?
9. What did you learn while playing?

Appendix B: Class Picture

(Including the infamous Pickle Man, Dill Dog, Super Ms. Steffenie & Tallulah)