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Implementing Self-Selected Outdoor Play for Preschoolers

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Abstract

As preschool-aged children spend more time using electronic devices and studying academic content, they are spending increasingly less time playing outdoors. Preschoolers spend a large portion of their days participating in sedentary activities. Outdoor play facilitates children's development and learning in many areas including health, social and emotional skills, and motor skills. Outdoor play has also been shown to assist children with academic learning. Early childhood professionals spend significant amounts of time with young children and are largely responsible for providing outdoor play experiences for the children within their care. This school improvement plan documents the need for an Iowa preschool to implement daily student-selected outdoor play in a newly created outdoor area. The plan targets improving students' fine motor skills, problem-solving skills, and mathematical skills in an outdoor environment. Additionally, the plan addresses the areas and materials that should be available to the students in the outdoor space and incorporates student choice and interest.

Keywords: outdoor play, self-selected play, early childhood, health, development, learning, environment, materials, fine motor, mathematics

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Introduction

Within the last two decades, educational means and expectations of children have changed in Iowa and across the country. With its full implementation in 2008, the Iowa Core Curriculum created rigorous academic standards and benchmarks for children in kindergarten through high school (Iowa Department of Education, 2022). Updated in 2018, The Iowa Early Learning Standards for children ages zero through five aligned with the Iowa Core (Iowa Department of Education, 2018). While academic success is important, it is not the only aspect of a child's education. The problem is with the increased attention on academic gains, children at increasingly younger ages spend more time participating in inactive, indoor activities and less time learning through play and outdoors. During the daytime, preschool children are only participating in physical movement about 50% of the time (Määttä, 2020). During the other 50% of the day, preschool children are sedentary; Määttä (2020) defines sedentary as time when children are "sitting, reclining, or lying." Unfortunately, according to Määttä (2020), preschool children's sedentary behaviors continue to increase. To boost their activity, young children should learn through play (Fatai et al., 2014). In a study conducted in Malaysia, researchers in a preschool classroom discovered how children learn valuable skills through play, including social skills, learning by watching others, and problem-solving skills (Fatai et al., 2014). With less time learning through play and less self-selected outdoor play, preschool children are missing opportunities for physical activity, development, and various types of learning.

The purpose of this school improvement plan is to implement self-selected outdoor play for preschoolers. The goals for this implementation are to increase students' physical activity and to limit their screen time. Additionally, implementing self-selected outdoor play will assist

with motor development and will encourage social, cognitive, and experimental, hands-on learning.

The goal of this research is to answer the questions: “Why is self-selected outdoor play valuable for preschool students?” and, “How can teachers provide an environment that facilitates students’ outdoor learning?” By completing the research and by designing a school improvement plan, teachers can share information with the preschool’s stakeholders and purchase or collect necessary items to support children’s learning outdoors.

As part of the school improvement plan, the literature review contains information from several peer-reviewed journal articles published between 2013 and 2022. These articles were collected from the online databases ERIC and EBSCO provided by Northwestern College and the Le Mars Public Library, respectively. Search terms included but were not limited to early childhood, preschool, outdoor, outside, environments, and play. All articles cited in the literature review contain studies of children, their parents, or teachers. Child participants had not yet attended the equivalent of American kindergarten or were currently attending kindergarten.

The literature review describes topics such as play, outdoor play, health, development, and learning. These topics describe how self-selected outdoor play is valuable for preschool children. Additionally, the literature review includes information about how to arrange a preschool’s outdoor environment and the materials to purchase or collect for children’s exploration and learning.

Review of the Literature

Outdoor Play

In a study conducted by Hu, Li, De Marco, and Chen (2015), 28 graduate students majoring in preschool education rated several early childhood programs’ outdoor spaces and

interactions among teachers and students. The graduate students used the Outdoor Play Rating Scale (OPRS), which rates programs using eight criteria with ratings from one to seven and the following descriptions: "Inadequate (1), Minimum (3), Good (5), and Excellent (7)," (Hu et al., 2015). After completing the initial ratings, the graduate students assigned each classroom a final rating: "Level 1 (high quality), Level 2 (moderate quality), and Level 3 (low quality)," (Hu et al., 2015). According to the findings, most outdoor play was teacher-directed, and young children needed to spend more time outdoors (Hu et al., 2015).

Yildirim and Akamca (2017) echoed these results in their research. During the 2015-2016 school year, 35 children attended a 10-week preschool program for 20 hours per week. The program focused on outdoor play and contained 90 outdoor activities for children to explore. Using pretests and posttests, teachers rated children's cognitive, motor, linguistic, social, and emotional skills. Based on the results, the authors recommended outdoor play and activities for preschool children. They highlighted how colleges and universities should educate preservice teachers in implementing outdoor play and how schools should provide training to practicing teachers (Yildirim & Akamca, 2017).

Coates and Pimlott-Wilson (2019) also agreed with the results, as their research proved young children crave play-based, outdoor learning. In their article in *British Educational Research Journal*, Coates and Pimlott-Wilson (2019) described how researchers interviewed young children and their teachers about their learning preferences. The authors focused on children's opinions and grouped their responses into three categories, one of which included learning through play. One child said, "[Playtime] makes me feel like all the stress has gone and I can finally stop worrying about maths and start thinking about happiness," (Coates & Pimlott-Wilson, 2019). The authors concluded children enjoyed outdoor play and felt autonomy when

playing self-selected outdoor activities. Children were likely to participate in imaginative, creative, experimental play when they were allowed to select their own activities while playing outdoors (Coates & Pimlott-Wilson, 2019).

Based on the findings of Hu, Li, De Marco, and Chen (2015); Yildirim and Akamca (2017); and Coates and Pimlott-Wilson (2019), preschool children need frequent access to outdoor environments. They need freedom to make their own choices in an outdoor environment that is both enjoyable and educational.

In a study documented by Berg (2015), researchers used three tools to collect information about preschoolers' physical activity within four preschool settings. The three tools were the System for Observing Play and Leisure Activity in Youth (SOPLAY), Children's Activity Rating Scale, and the Observation for Recording Physical Activity in Children—Preschool Version. Results indicated preschool children spent a large amount of time participating in sedentary activities. During the study, 51% of the 2,268 observations included sedentary time (Berg, 2015).

Research recorded by Tandon, Saelens, and Copeland (2016) confirmed Berg's (2015) results. In their article, the authors described a study in which parents and childcare providers from 30 centers completed surveys about preschoolers' physical activity and outdoor time. Questions involved how outdoor play related to illness and learning opportunities for preschool children. Survey results depicted how preschool children spent much of their time in the care of early childhood professionals who were responsible for promoting outdoor play within their programs. Unfortunately, the research showed children were sedentary for most of the hours within the day (Tandon et al., 2016).

Byrd-Williams, Dooley, Thi, Browning, and Hoelscher (2019) recorded similar results in their research. They described a study in which licensed childcare centers and homes completed surveys concerning their outdoor environments, practices, and policies pertaining to outdoor time for the children within their care. After compiling results of 827 surveys, researchers concluded prekindergarten children needed less sedentary time and more physical activity. The authors emphasized how childcare providers needed to update written policies about outdoor play and needed to educate staff, children, and families about the importance of healthy behaviors in early childhood environments (Byrd-Williams et al., 2019).

Based on the findings of Berg (2015); Tandon, Saelens, and Copeland (2016); and Byrd-Williams, Dooley, Thi, Browning, and Hoelscher (2019), preschool children spend too much time participating in sedentary activities. Implementation of outdoor free play would encourage children to get up and get moving, resulting in healthy behaviors; therefore, early childhood professionals need to develop practices to provide outdoor play experiences.

Health

Screen Time

Balci and Ahi (2017) researched how children's play changed over time. Their research included a questionnaire and a meeting for parents. The questionnaire asked information about the parents' ages, the amount of time they spent outdoors as children, the games they played as children, their opinions about the benefits of outdoor play, and how their experiences differed from their children's experiences related to outdoor play. A total of 419 parents from the ages of 21-63 responded to the survey. The questionnaire indicated children's parents spent much more time outdoors than their children did. The parents' outdoor play included cooperative and competitive games. Additionally, the parents reported their children tended to spend time using

electronics rather than playing outdoors. When their children were outdoors, they chose independent activities such as riding bicycles rather than cooperating with their peers. Based on the questionnaire, researchers concluded today's young children participate in screen time instead of spending time outdoors (Balci & Ahi, 2017).

In a 2017 study, researchers documented how children's social skills changed after providing less screen time for preschoolers (Hinkley et al.). The preschoolers in the study were between the ages of 4.2 and 5.5 years and participated in academic learning in one of two ways: wholly online or online with one group session. The authors explained how less screen time allowed for additional outdoor play time while the students were learning from home. According to the findings, children developed skills such as empathy, engagement, and self-control when they had more outdoor learning (Hinkley et al., 2017).

Another study conducted by Hinkley and her colleagues (2018) produced similar results. In the 2018 study, researchers collected information from 575 mothers of children who were ages two through five years using an online survey titled Adaptive Social Behavior Inventory (ASBI) (Hinkley et al.). The survey required mothers to record information about their children's screen usage, including watching videos or television, using electronic games, and participating in outdoor play time. The results indicated children had opportunities for social interaction during outdoor play, and screen time may have limited children's opportunities to interact with their peers (Hinkley et al., 2018).

Based on the 2017 study conducted by Balci and Ahi, the 2018 study conducted by Hinkley et al., and the 2018 study conducted by Hinkley et al., preschool children need more outdoor play time and less screen time. Providing outdoor free play for preschoolers would limit screen time, encourage them to interact with their peers, and positively impact their social skills.

Physical Activity

Byrd-Williams et al. (2019) conducted research on the policies and operations concerning children's physical activity in Texas childcare centers and childcare homes. Childcare employees completed surveys with questions about their outdoor learning environments, screen time, and physical activity for children within their childcare locations. Based on the 827 surveys collected, most childcare facilities did not meet the minimum recommendations for children's physical activity. Byrd-Williams et al. (2019) deduced childcare providers needed to increase physical activity practices by encouraging physical activity through posters, pictures, and books and by providing professional development trainings for their staff. Because "outdoor time has been found to be the strongest predictor of meeting physical activity best practices," the authors highly suggested increasing children's daily outdoor play time (Byrd-Williams et al., 2019).

Acknowledging the importance of physical activity and outdoor play, Driediger et al. (2019) tested how shorter and more frequent periods of outdoor play affected preschool children's Moderate to Vigorous Physical Activity (MVPA). The eight-week study required childcare centers to change their outdoor learning times from two 60-minute periods to four 30-minute periods of outdoor play each day. After collecting information using accelerometers, demographic questionnaires, anthropometric measures, and outdoor play logs, the researchers concluded MVPA did not improve based on the duration and frequency of the outdoor play time, only that outdoor play time was valuable (Driediger et al., 2019).

Wadsworth et al. continued studying MVPA in preschool children by conducting a 2020 study. Wadsworth et al. studied how to stimulate Moderate to Vigorous Physical Activity (MVPA) while preschoolers participated in outdoor play (2020). In the study, researchers

collected data by attaching accelerometers to the hips of the participants and documenting the types of motor skills that elicited the most physical activity. Types of motor skills included "fundamental motor skill focus (FMS), physical activity focus (PA), FMS and PA (FMS + PA), and control," (Wadsworth et al., 2020). During FMS, the teacher demonstrated activities and provided instruction and feedback to the children while they participated in play; there was a large focus on correct techniques. During PA, the teacher allowed for less structured physical activity while encouraging children to remain active during the duration of the activity with less focus on precision (Wadsworth et al., 2020). The results indicated preschool children needed a combination of FMS and PA interventions during their outdoor play for optimal MVPA (Wadsworth et al., 2020).

Based on the studies concerning physical activity, childcare facilities played a large role in the amount of physical activity children received (Byrd-Williams et al., 2019). To maximize children's physical activity while in childcare, it was important for them to participate in outdoor play experiences that were both focused on fundamental motor skills and continued movement (Wadsworth et al., 2020). Activities such as throwing a ball into a hoop and kicking a ball into a goal would develop children's fundamental motor skills. Dancing, running, and hopping would increase children's physical activity by keeping them moving.

Development and Learning

Social-Emotional Skills

In a 2018 study, Largo-Wighta et al. researched how outdoor classrooms impacted students' behavior. The study took place in the United States and included two classes of kindergarten children. Over six weeks, one class participated in a language arts lesson in an outdoor setting. The other class was indoors for their lesson. During observations, researchers

documented the number of behavioral redirections by teachers per minute. Redirections included both verbal and nonverbal cues. Additionally, researchers documented children's off-task behaviors and collected information about children's feelings about the language arts lessons. Researchers concluded students in the outdoor classroom required significantly fewer redirections and were off task less than the students in the control group. While students did not report large differences in happiness between the two settings, teachers reported better student well-being in the outdoor environment (Largo-Wighta et al., 2018).

Nedovic and Morrissey (2013) had similar results to Largo-Wighta et al. in their earlier study of three- and four-year-old children. Early childhood professionals introduced an outdoor learning environment to the children and observed the children's social interactions and on-task behavior. After nine weeks, teachers expressed positive results of implementing self-selected outdoor play. They said children's play was more focused and that children had positive interactions with their peers. Additionally, teachers said, "There is far less pushing, shoving, and kicking happening…and the children seem less hyperactive…" (Nedovic & Morrissey, 2013).

Based on the 2013 (Nedovic & Morrissey) and 2018 (Largo-Wighta et al.) results, children benefit from outdoor play and learning. They have better focus, less hyperactivity, and more positive interactions with other children.

Cognitive/Academic Skills

In 2017, Yildirim and Akamca researched how outdoor experiences impacted preschoolers' development. The study included 35 disadvantaged preschoolers in Turkey who were offered 10 weeks of outdoor activities in a preschool environment. The activities were based on the Turkish Ministry of Education's preschool education program and included "90 activities aiming to improve children's cognitive, motor, linguistic, social, and emotional

development," (Yildirim & Akamca, 2017). At the study's conclusion, the authors reported, "The difference between the pretest scores and the posttest scores for cognitive skills was statistically significant," (Yildirim & Akamca, 2017). Based on the results, Yildirim and Akamca (2017) highly encouraged early childhood professionals to include outdoor activities in early education classrooms.

Similarly to Yildirim and Akamca (2017), Khwaengmek et al. (2021) published their findings concerning how the outdoors impacted students' academic skills. Their study included the perceptions preservice teachers had about outdoor learning and STEM (science, technology, engineering, and math) education. The preservice teachers had experienced STEM in classrooms but had not yet held contracted teaching positions. In the study in Thailand, preservice teachers completed questionnaires about their experiences with STEM outdoor learning. The results indicated preservice teachers' positive beliefs about children learning science, technology, engineering, and math in outdoor settings. Teachers emphasized how students simultaneously learned academic information while having fun in the outdoors (Khwaengmek et al., 2021).

In a study in Whales, Davies and Hamilton (2016) researched the use of formative and summative assessments in outdoor settings. In addition, they recorded the benefits of outdoor learning for preschool children. In the 2016 study, Davies and Hamilton utilized questionnaires and semi-structured interviews to collect information from teachers and teaching assistants who had been working with children for three months to 40 years. Some questions included the areas of learning the teachers assessed outdoors, why teachers chose to assess indoors or outdoors, assessment methods, and trainings the teachers had received about utilizing outdoor environments. The early childhood professionals' results were like those of Yildirim and Akamca (2017) and of Khwaengmek et al. (2021) stating, "…assessing children in the outdoor

environment [had] value," (Davies & Hamilton, 2016). Also, "The benefits of outdoor learning to children's development [are] clearly recognized by practitioners…" (Davies & Hamilton, 2016). Results indicated how all areas of learning and development within early childhood curriculum could be implemented and assessed in outdoor spaces (Davies & Hamilton, 2016).

Based on studies concerning the cognitive and academic benefits of outdoor play, early childhood professionals should provide outdoor play experiences for their students and should utilize the outdoor environment for both formative and summative assessments (Davies & Hamilton, 2016). Outdoor play positively impacts students' academic abilities (Yildirim & Akamca, 2017) and positively impacts students' 21st Century skills relative to science, technology, engineering, and math (Khwaengmek et al., 2021).

Motor Skills

Yildirim and Akamca (2017) researched the results of outdoor play on preschool children's developmental skills, including motor skills. Children whose families typically could not afford preschool were offered 10 weeks of outdoor preschool for five days per week, totaling 50 sessions. Using pretests and posttests, researchers documented students' various abilities using a score of one for the presence of a skill and zero for the absence of a skill. Following 10 weeks of intervention, "The scores for psycho-motor skills significantly differed between the pretest and posttest," (Yildirim & Akamca, 2017). Children's motor skills improved greatly following the 10 weeks of outdoor play (Yildirim & Akamca, 2017).

Also in 2017, Monti et al. researched the outcomes of outdoor play in early childhood classrooms. In the study, they implemented Outdoor Education (OE) in Italian nursery schools. The control group included 160 young children who participated in "traditional educational activities," (Monti et al., 2017). The test group included 84 children who participated in an OE

program. When comparing the control and the test groups, researchers determined the children who participated in OE had significantly higher improvements in areas such as "cognitive, emotional, social, and fine motor skills," (Monti et al., 2017). The authors, similarly to Yildirim and Akamca (2017), stressed the importance of outdoor play in facilitating learning in several areas of early childhood development, including fine motor development (Monti et al., 2017).

Based on multiple studies, young children benefit from outdoor play and experiences. Through outdoor play, children not only gain academic knowledge and social and emotional skills but also fine motor development, which strengthen the muscles in their hands and fingers (Monti et al., 2017).

Environment

Area

In 2015, Merewether researched children's most valued spaces within outdoor environments. The study began by building rapport with the preschool children and by making observations of children's favorite areas in which to play. Children took pictures of their favorite areas and ranked the top three. Additionally, children described their favorite areas and drew pictures of them. Merewether (2015) reported children preferred areas that promoted "socializing, pretending, observing, and moving."

Zamani agreed with Merewether's (2015) research methods and conducted a 2017 study about children's favorite outdoor environments. In her study, children ranging in age from four years to five years selected three of their favorite outdoor areas by selecting photographs. Then, they responded to questions about why they selected the areas and about what types of play they conduct in the areas. Based on the children's choices, Zamani (2017) suggested preschool teachers and administrators consider children's enjoyment when designing outdoor areas.

Suggestions included a mixture of manufactured and natural elements, areas for dramatic play, and structures for climbing and hiding (Zamani, 2017).

Similarly to Merewether (2015) and Zamani (2017), Clevenger and Pfeiffer (2022) conducted a study about the indoor and outdoor play spaces available to young children and about children's favorite spaces. To collect results, the authors relied on teachers' reports because teachers were typically responsible for setting up the indoor and outdoor learning centers (Clevenger & Pfeiffer, 2022). Teachers received a list of 13 indoor learning centers and eight outdoor learning centers and were asked to place checkmarks next to the centers available to their students. Next, they were asked to rank the centers by where children preferred to play and by which areas promoted physical activity. Common outdoor spaces included "open, grassy areas, fixed equipment, sandbox, and places for sitting," (Clevenger & Pfeiffer, 2022). Teachers reported the open grassy areas and the sandbox as children's favorite spaces. If outdoor spaces contained paved areas, those were also popular among students and encouraged children's play (Clevenger & Pfeiffer, 2022). Like Merewether (2015) and Zamani (2017), Clevenger and Pfeiffer (2022) encouraged early childhood professionals to be cognizant of which areas in the outdoor environment may lead to the most student engagement and physical activity.

Merewether (2015), Zamani (2017), and Clevenger and Pfeiffer (2022) agreed some outdoor play spaces were essential for children's enjoyment and learning. Based on their results, children needed large, grassy areas to play and exercise, and they needed spaces for dramatic play and sensory activities (Clevenger & Pfeiffer, 2022). Additionally, it was essential to consider children's interests and needs when designing an outdoor space.

Materials and Interactions

In a 2013 study, Nedovic and Morrissey analyzed children's responses to an organic learning environment. Teachers collected information from students about what manipulatives and materials they desired to have in the space. Children largely requested natural or recycled materials and loose materials they could examine. Teachers also requested natural materials and strived to encourage sensory play, appreciation of nature, and creative play. After implementing the organic learning environment, teachers noted an increase in children's dramatic play experiences and an increase in physical activity. Additionally, teachers observed less hyperactivity, less physical rough-housing and fighting, and overall better relationships (Nedovic & Morrissey, 2013).

Comparably to Nedovic and Morrissey (2013), Tonge, Jones, and Okely (2018) researched relationships in children's outdoor play environments. The researchers used the CLASS (Classroom Assessment Scoring System) and studied children from ages two through five in 11 early childhood centers in Australia. They documented information from both children and teachers. Based on results from the CLASS, Tonge, Jones, and Okely (2018) reported one major recommendation for improving teacher-child interactions: making outdoor time part of a frequent, consistent routine. The authors stated, "…increasing the amount of time spent outdoors has shown a significant influence on quality educator and child interactions in outdoor environments," (Tonge et al., 2018).

Based on research concerning materials and interactions, preschoolers' outdoor environments need to include objects for manipulation and learning. Additionally, the outdoor environment and its frequent availability to children can play a role in how children interact with one another and with the adults who care for and teach them.

School Profile & Baseline

Student Performance

The Director/Teacher at Noah's Ark Preschool utilizes both formative and summative assessments to determine students' progress in several areas of learning and development. Both the Director/Teacher and the Assistant Teacher formatively assess students daily. Summative assessments occur in September, January, and April and are conducted by the Director/Teacher. Areas of assessment include self-help and self-awareness, social-emotional skills, communication and language skills, large and fine motor skills, cognitive skills and approaches to learning, math skills, and literacy skills. Literacy skills include competencies in both pre-reading and pre-writing. The teacher-created assessments are based on the Iowa Early Learning Standards—3rd Edition (Iowa Department of Education, 2018), Teaching Strategies GOLD (2022), Learning Without Tears (2022), and the learning objectives for Noah's Ark Preschool.

During the winter of the 2021-2022 school year, the Director/Teacher conducted mid-year assessments and determined students, overall, were making progress toward the preschool's learning goals. Some areas to continue emphasizing included number recognition and other early math skills and cutting with scissors and other fine motor skills.

Student and Community Characteristics

Noah's Ark Preschool does not collect information about families' socio-economic statuses, but there are three families receiving partial or full scholarships from the church where Noah's Ark Preschool is located. Ninety-four percent of the preschoolers are Caucasian, and 100% of the students live in Le Mars, Iowa or in a community within 10 miles of Le Mars. Two students receive speech therapy services, and no students are currently on Individualized Education Programs (IEPs).

According to the United States Census Bureau, Le Mars, Iowa's population in 2020 was 10,571. The mean household income between 2015 and 2019 was $65,095. Approximately 95% of individuals described themselves as "white alone," (United States Census Bureau, 2020). Other races in Le Mars included American Indian and Alaska Native, Asian, Hispanic or Latino, or two or more races. Persons born in a country besides the United States of America included 3% of the Le Mars population, according to the Census Bureau (2020).

School Characteristics

Noah's Ark Preschool is licensed by the Iowa Department of Human Services (DHS) and is located within a Presbyterian church. The preschool is a mission of the church and has two employees: a Director/Teacher and an Assistant Teacher. Based on DHS licensure requirements, the classroom may contain up to 19 students at one time. Currently, the preschool has three class sessions, totaling 49 students. Based on teacher-child ratios, physical space, and licensing requirements, the maximum total enrollment is 50 students.

The indoor classroom includes several learning centers including literacy, pretend, blocks and building, table toys (fine motor activities and games), art, and writing. The outdoor space was built in 2021 and contains a large grassy space and a large concrete area. Both are encompassed by a six-foot fence. There are several manipulatives and toys available for the children to explore while in nature, and the items are stored in a shed within the outdoor space.

Parent Involvement

At Noah's Ark Preschool, many of the students' parents work outside the home and are unable to participate in daily preschool activities. Many parents, however, are eager to contribute to the preschool for various one-time occasions. For instance, during the winter and spring months, parents volunteered to read to the class as mystery readers. During the 2021-

2022 school year, the Director/Teacher added additional time slots for mystery readers, as the first signup list filled within a short time. Additionally, families often share their talents. In the past, parents have held presentations for the students, hosted the preschoolers at their places of employment, and brought their animals to show the preschoolers. During the 2021-2022 school year, the preschoolers got to see, learn about, and touch a rabbit, a piglet, and a goat.

In addition to sharing their time and talents, the parents at Noah's Ark Preschool also make generous donations to the preschool. Parents contribute monetary donations toward the cost of field trips. They also donate items such as snacks, paper products, school supplies, and hygiene products.

School Mission & Vision

The mission of Noah's Ark Preschool is

- To make preschool a positive and happy foundation for the children and for their families
- To meet each child's physical, emotional, mental, social, and spiritual needs in a warm and friendly atmosphere
- To provide a nondenominational Christian approach to preschool
- To encourage a sense of right and wrong, to show love and respect for others, and to be guided by Christian values
- To accept each child's individual and unique needs and to meet them to the best of our abilities
- To always remember that each child is a very special and important person with deep feelings and that each child has something to contribute

- To provide age-appropriate activities and learning materials to develop self-care skills, language skills, academic skills, conversation and sharing skills, social skills, and large and small motor skills
- To never be a substitute for parents but someone the child can count on for friendship, fairness, guidance, encouragement, love, and acceptance, no matter what the child's behavior and developmental pattern (Noah's Ark Preschool, 2022)

Because Noah's Ark Preschool is located within and is a mission of a church, the vision for Noah's Ark Preschool is to provide high-quality early childhood education while instilling Christian values. The teachers and stakeholders of Noah's Ark Preschool understand how impactful early experiences are for children, so the teachers strive to facilitate both academic and spiritual education.

Current Student Learning Goals

According to the students' mid-year assessments conducted in January 2022, the preschoolers were making gains in many areas. The preschoolers learned the rules and routines of the preschool classroom, and only two of the 47 assessed students continued struggling with detachment. The preschoolers made progress with social skills while being near and playing with their peers. Of the assessed students, 94% participated in cooperative play, and just 6% of students participated in parallel or associative play. During the second semester, many of the five-year-old children learned how to play board games and card games to master social, math, and literacy skills.

The preschoolers' academic skills improved, too. All the children identified all or nearly all the colors. Individually, students made progress in identifying shapes, numbers, and letters. The children progressed in math, literacy, and motor skills as well.

The Director/Teacher identified several learning goals based on the mid-year assessments. One goal was increased focus on STEM (science, technology, engineering, math) and problem-solving skills. A math goal included number recognition. Fine motor goals included proper pencil grip and cutting with scissors.

Teacher Work, Curriculum, Instruction, Assessment, and Professional Development

The Director/Teacher at Noah's Ark Preschool has been in her current position for 10 years and has five additional years of experience in early childhood education. During her time at Noah's Ark Preschool, she created a curriculum supported by the Iowa Early Learning Standards (Iowa Department of Education, 2018) and created age-specific assessments based on the Iowa Early Learning Standards (Iowa Department of Education, 2018), Teaching Strategies GOLD (2022), and Learning Without Tears (2022). She implemented technology and created play-based learning centers. Additionally, she wrote several successful grant applications, totaling several thousands of dollars to purchase educational manipulatives, books, puppets, and dress-up clothes. The Director/Teacher also wrote a grant in 2020 to create an outdoor learning environment for the preschool.

The Director/Teacher completed hundreds of hours of professional development. Professional development trainings covered a wide variety of topics including but not limited to autism spectrum disorder (ASD), literacy, play-based learning, attention deficit hyperactivity disorder (ADHD), transitions, Visual Phonics, Teaching Strategies GOLD, Adverse Childhood Experiences (ACES), emergent writing, Love and Logic, children's behaviors, and conferencing

with parents. The Director/Teacher's credentials include a bachelor's degree in Elementary Education, a reading endorsement, and an endorsement in Early Childhood Integrated Setting.

The Assistant Teacher has been in her role at Noah's Ark Preschool for five years and previously held a job where she promoted early literacy for infants. During her time at Noah's Ark Preschool, she learned about topics such as curriculum and assessment in early childhood, building relationships with children and families, and creating play spaces for young children. She completed 50 hours of professional development trainings within the last five years.

Noah's Ark Preschool utilizes several instructional strategies to foster student development and learning. Because the Director/Teacher's philosophy of education heavily focuses on building positive relationships, she and the Assistant Teacher concentrate on speaking with and playing with the children. While playing with children, the teachers scaffold the children's learning and assist them in making connections, in solving problems, and in understanding cause and effect.

At Noah's Ark Preschool, there is a large focus on early literacy development. Teachers use daily read-alouds, emergent writing activities, Visual Phonics (International Learning Institute, 2011), and frequent literacy activities focusing on syllables, letter names, alliteration, book-handling, and comprehension. The classroom is a print-rich environment, containing a word wall, word and picture labels, books in several areas, and literacy-based manipulatives in various learning centers.

Preschool children learn in various ways while at Noah's Ark Preschool. The Director/Teacher plans individual, small group, and large group activities, and the children have self-selected play time for at least one hour per class session. Because children's learning styles vary, teachers provide experiences for auditory, kinesthetic, and visual learners. Through these

experiences, children learn and develop a multitude of skills, which meet the Iowa Early Learning Standards—3rd Edition (Iowa Department of Education, 2018).

Needs Assessment

Noah's Ark Preschool has many positive attributes, but based on the school profile, an area in need of improvement involves improving curriculum and instruction. One way to improve is to develop and utilize the newly built outdoor space. The space was completed in 2021 but is not being used to maximize student learning and development. Additionally, self-selected outdoor time has not yet become a staple in the school day.

Outdoor play time is an important part of preschool curriculum. According to Deaver and Wright (2018), children have authentic opportunities to interact with other children during outdoor play; these experiences enhance children's social skills and increase problem-solving skills. Dennis, Kiewra, and Wells (2019) stress how outdoor play increases children's abilities to solve problems and to experience hands-on learning in science, technology, engineering, and math (STEM). Based on the school profile, STEM is an area the Director/Teacher recognizes as needing more attention.

To improve the curriculum at Noah's Ark Preschool, it is important to provide outdoor play time because of its physical benefits. During self-selected outdoor play, children enhance their physical and mental well-being (Dennis et al., 2019). Children can use and build large muscles by climbing, running, throwing, jumping, and kicking. They can use and develop small muscles by manipulating small toys, rocks, sticks, and pinecones. Based on the school profile, increasing fine motor skills is one of the Director/Teacher's goals.

Noah's Ark Preschool is now equipped with a grassy area, a concrete area, a fence, a shed, and a door leading from the classroom to the outdoor space. With those large features in

place, it is important to recognize the significance of outdoor play on children's development and learning and to take steps to make outdoor play part of the school day. It is equally important to properly equip the environment with items and experiences that will enhance children's learning and development and to positively impact curriculum and instruction at Noah's Ark Preschool.

School Data & Analysis

The Director/Teacher at Noah's Ark Preschool conducted complete summative assessments in September 2021 and April 2022. Parent-teacher conferences followed in October and April. Summative assessments were based on the Iowa Early Learning Standards—3rd Edition (Iowa Department of Education, 2018), Teaching Strategies GOLD (2022), Learning Without Tears (2022), and the objectives of Noah's Ark Preschool. In January, the Director/Teacher completed a less extensive assessment to gauge student achievement and to plan lessons for the remainder of the school year. In the preschool classroom, the Director/Teacher and Assistant Teacher utilize daily formative assessment to scaffold children's learning through planned activities and through children's play. According to the summative and formative assessments of the students, two areas upon which Noah's Ark Preschool can improve include STEM and fine motor skills.

In the area of STEM, the Director/Teacher assessed children's knowledge and abilities in several areas of mathematics. Additionally, the Director/Teacher assessed children's abilities to solve problems. Other areas of STEM such as science, technology, and engineering were included in the curriculum through planned large group and small group activities and included in the children's play but were not included in summative assessments. Items such as specimens, rocks, magnets, and binoculars were available for children to explore for STEM-based play.

When assessing a class of 17 four- and five-year-old children in September 2021, the Director/Teacher identified none of the students as proficient in solving problems. The children heavily relied on teachers to solve problems for them. As shown in Table 1, more students became proficient as the year progressed. Increasing students' problem-solving skills remains a goal for Noah's Ark Preschool.

Table 1

Children's Problem-Solving Skills

	Number of Students (out of 17) Who Met the Goal		
Problem Solving	**September 2021**	**January 2022**	**April 2022**
Uses problem-solving skills	0	Not Assessed	9

When comparing the students' math skills and knowledge at different times during the 2021-2022 school year, assessments indicated students were making progress in all mathematical areas. Some students needed additional practice classifying and reclassifying objects, predicting what came next in a pattern, making sets of 6-10 objects, appropriately responding to positional words, accurately counting 10 objects, accurately counting to 20, identifying shapes, and identifying numbers. While students made progress as the year progressed, additional strategies for increasing children's math skills and knowledge remain necessary at Noah's Ark Preschool. Additional information about students' abilities can be found in Table 2.

Table 2

Children's Math Skills and Knowledge

Math Skills and Knowledge	Number of Students (out of 17) Who Met the Goal		
	September 2021	**January 2022**	**April 2022**
Classify & reclassify objects	13	Not Assessed	13
Select which group has more or less	17		17
Select which object is bigger or smaller	17		17
Predict what comes next in a pattern	15		16
Make sets of 6-10 objects	12		16
Respond appropriately to positional words	14		16
Accurately count 10 objects	14	16	17
Accurately count to 20	7	10	13
Identify 8 shapes	10	13	15
Identify numbers 0-20 Noah's Ark Preschool Objective Identify numbers 0-10 Teaching Strategies GOLD Objective (2022)	4 10	4* 15	7** 15
*7 students recognized all but 1-3 of the numbers from 1-20. **5 students recognized all but 1-3 of the numbers from 1-20.			

While many of the students met the goals for fine motor skills by the end of the 2021-2022 school year, there were some children who needed continued fine motor practice. According to the data in Table 3, a few students needed developed fine motor strength and coordination to zip their coats, to button a small button, to properly hold a pencil, to hold a scissors properly, and to cut accurately.

Table 3

Children's Fine Motor Skills

Fine Motor Skills	Number of Students (out of 17) Who Met the Goal		
	September 2021	**January 2022**	**April 2022**
Zip coat	5	Not Assessed	14
Lace small beads on a string	17		17
Button a small button	12		15

Hold pencil properly	15	15	16
Hold scissors properly	13	14	16
Cut accurately	11	15	16

The data indicated the group of 17 students at Noah's Ark Preschool gained skills and knowledge in the areas of STEM and fine motor skills. Some strengths included identifying more or less, identifying bigger or smaller, and lacing beads on a string. Some weaknesses included problem-solving skills, counting objects, counting to 20, and identifying numerals. Necessary additional assessments may include information about the specific numerals children could not identify. Information about the indoor and outdoor fine motor activities and STEM experiences available to the children would be helpful as well.

Action Plan

To improve curriculum and instruction at Noah's Ark Preschool, it is important to utilize the newly constructed outdoor space. According to 2021-2022 assessments, the two areas of curriculum and instruction that needed improvement were fine motor skills and STEM education, specifically math. Both fine motor development and math education can take place in an outdoor setting.

Studies show how outdoor play increases students' fine motor skills. In a 2017 study, Yildirim and Akamca researched the results of outdoor play on preschoolers' abilities in many areas, one of them including motor development. Students' motor skills significantly improved during the duration of the 10-week study, and the authors encouraged preschool programs to include outdoor play (Yildirim & Akamca, 2017). In 2019, Coates and Pimlott-Wilson conducted interviews with professionals and young students about children's outdoor experiences compared to indoor experiences. They concluded outdoor play at preschool

positively impacted many areas of development and learning, including fine motor skills (Coates & Pimlott-Wilson, 2019).

In addition to fine motor skills, studies show how outdoor play increases students' cognitive skills, including those found in science, technology, engineering, and math (STEM). In a 2016 study in Hamilton County, Ohio, researchers concluded outdoor learning and physical activity did not limit academic learning opportunities but rather enhanced them (Tandon et al., 2016). Yildirim and Akamca's 2017 study of how outdoor experiences impacted preschoolers' development mimicked these results. Their findings showed how experiences in nature positively impacted cognitive abilities in preschool children (Yildirim & Akamca, 2017). The authors encouraged early childhood educators to incorporate outdoor learning into their school days. Additionally, they recommended teachers' pre-service training and professional development trainings include information about utilizing outdoor spaces to enhance children's learning (Yildirim & Akamca, 2017).

To assist children in developing both fine motor skills and mathematical abilities, the Director/Teacher at Noah's Ark Preschool will …

- Speak with other local early childhood professionals to discuss their and their students' favorite outdoor activities
- Ask the students at Noah's Ark Preschool about what toys and activities they desire to see in their outdoor area. Students will participate in grand discussion and communicate their ideas through drawings.
- Organize and create an inventory of current outdoor manipulatives in the newly built shed
- Purchase additional manipulatives with leftover funds from the 2020 grant

- Rotate manipulatives in and out of the outdoor area to meet students' needs as their abilities and interests change throughout the school year
- Make fine motor and math activities available in all areas of the outdoor play space
- Provide manipulatives and activities that assist with fine motor development while meeting all other content areas of the Iowa Early Learning Standards—3rd Edition (Iowa Department of Education, 2018). The cross-curricular areas include social and emotional development, approaches to learning, social studies, creative arts, communication, language and literacy, math, and science (Iowa Department of Education, 2018). Table 4 describes several outdoor activities and manipulatives that satisfy learning standards in multiple curricular areas in conjunction with fine motor skills.
- Provide manipulatives that assist with mathematical skills while meeting all other content areas of the Iowa Early Learning Standards—3rd Edition (Iowa Department of Education, 2018). Table 5 describes outdoor math manipulatives and activities that fulfill learning standards in multiple curricular areas.

Table 4

Connecting Fine Motor with Other Curricular Areas

Outdoor Fine Motor Activity or Manipulative to Improve Physical Well-Being and Motor Development	Cross-Curricular Area	Standard
Sidewalk chalk	Communication, Language, and Literacy Creative Arts	Early Writing Art
Easel with paper and paint	Communication, Language, and Literacy Creative Arts	Early Writing Art

Tongs for collecting rocks, sticks, etc.	Science Approaches to Learning	Curiosity and Initiative Exploration of the Environment
Sand with buckets and shovels	Approaches to Learning	Play and Senses
Dress up clothes with zippers, buttons, and snaps	Creative Arts	Dramatic Play
Musical instruments	Creative Arts	Music, Rhythm, and Movement
Puzzles of foods from around the world	Social Studies	Awareness of Culture
Tubes and balls	Science	Scientific Investigations and Scientific Reasoning
Parachute	Social-Emotional	Relationships with Children
Magnet board with numeral magnets	Science Math	Scientific Communication Comparisons, Numbers, and Operations
Iowa Department of Education (2018)		

Table 5

Connecting Math with Other Curricular Areas

Outdoor Math Activity or Manipulative	Cross-Curricular Area	Standard
Measuring cups in water table	Approaches to Learning	Play and Senses
Measuring spoons in pretend kitchen	Creative Arts	Dramatic Play
Child-safe measuring tape with tools and hardhats	Social Studies Creative Arts	Awareness of Family and Community Dramatic Play
Hopscotch game	Physical Well-Being and Motor Development	Large Motor Skills
Number stencils at art easel	Communication, Language, and Literacy	Early Writing
Insect counting game	Science	Scientific Communication
Beanbags containing numerals for a beanbag toss game	Social and Emotional Development	Relationships with Children
Puzzles containing numerals and counting	Physical Well-Being and Motor Development	Small Motor Skills
Numbered stepping stones	Physical Well-Being and Motor Development	Large Motor Skills
Pretend food with price tags	Creative Arts	Dramatic Play
Iowa Department of Education (2018)		

Conclusion

Table 6 displays the timeline for implementation of Noah's Ark Preschool's action plan. The timeline spans from May 2022 through June 2022. Additionally, Table 6 lists ongoing tasks beginning in August 2022. See Table 7 for the resources necessary to effectively execute the action plan.

Table 6

Implementation

Timeline			
Early May 2022	**Mid May 2022**	**Late May 2022**	**June 2022**
Student Interests Ask the students at Noah's Ark Preschool about what toys and activities they would like to see in their outdoor area. Students will participate in grand discussion and will communicate their ideas through drawings.	**Collaboration** Speak with other local early childhood professionals to discuss their and their students' favorite outdoor activities. Contact the professionals via email.	**Inventory** Organize and create an inventory of current outdoor manipulatives in the newly built shed. Record the inventory using a Google Sheet	**Purchase** Purchase additional manipulatives with leftover funds from the 2020 grant. Be sure to include fine motor and math manipulatives in all areas of the outdoor play space. Be sure to include cross-curricular connections.
Ongoing Beginning in August 2022			
Rotation of Manipulatives Rotate manipulatives in and out of the outdoor area to meet students' needs as their abilities and interests change throughout the school year. **Assessment of Students' Interests and Abilities** Assess students' interests weekly using observation and questioning during their play. Assess students' abilities using daily formative assessment. Assess students' abilities using summative assessment in September, January, and April.			

Table 7

Resources for Implementation

Resources	
To collect information about students' interests	Use Canva.com to create an interest survey to use during grand discussion.
To collaborate	Utilize the websites of Le Mars Community Schools and Gehlen Catholic Schools to locate teachers' contact information. Le Mars Community School's website is http://www.lemars.k12.ia.us/?page_id=24&cn-s=preschool&cn-cat=. Gehlen Catholic School's website is https://www.gehlencatholic.org/who_we_are/staff_directory.
To create an inventory	Create a Google Sheet containing a list of the manipulatives and the content areas they support. Refer to the Iowa Early Learning Standards—3rd Edition for the descriptions of the standards.
To purchase	Request catalogs and/or view online catalogs from the following merchants: DiscountSchoolSupply.com, LakeshoreLearning.com, KaplanCo.com. Utilize the Iowa Early Learning Standards—3rd Edition to make cross-curricular connections.
To assess	Use Microsoft Word to create a checklist of the manipulatives available in the outdoor space each week. Make a tally mark next to the item once a child has played with it. If a manipulative has few or no checkmarks, assess its value in the space. Choose to move it, demonstrate how to use it, or replace it. Conduct this exercise once per week. Ask the children questions while they play. Questions may include, "Why did you choose to play with this today?" or, "Why is this your favorite outdoor activity?" Use the children's responses to make decisions about the manipulatives and activities available to them. Continue conducting summative assessments based on the Iowa Early Learning Standards—3rd Edition, Teaching Strategies GOLD, and Learning Without Tears.

Responsibilities for Implementation

The Director/Teacher will be responsible for all components of the plan. If additional shelving is necessary during the inventory process, she will contact the preschool's Property and Maintenance Commission and request their assistance in purchasing and building the shelves.

Plan for Monitoring Success/Failure of the Interventions

To monitor the success or failure of the interventions, the Director/Teacher will examine students' progress in fine motor skills and math competencies using the preschool's teacher-created assessments. She will compare students' abilities individually and as a group over the course of the school year and will compare students' abilities from the 2022-2023 school year to previous years' classes. The Director/Teacher will continue consulting the children about their ideas for improving the outdoor space. She will discuss the intervention with the children's families during parent-teacher conferences in October 2022 and April 2023 and document their viewpoints.

Barriers

Because this preschool is in Northwest Iowa, weather is always a factor in planning outdoor play. Weather may be too hot, too cold, too windy, too rainy, or too snowy to allow for safe outdoor play. The amount of outdoor time per day and the number of times per school year may affect the intervention's results.

Students' choices about the manipulatives with which they choose to play may also affect the plan's success. If students do not choose fine motor activities or math-related activities in the outdoor space, they will not reap benefits from the activities' presence.

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