

## *Designing Inclusive Play Experience*

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### **Abstract**

Play is essential to everyone, while it is often misperceived as a waste of time. Maria Montessori, who started the Montessori school in 1907, believed that play could be used for children to learn naturally and play was the work of the child. Play is unarguably vital to children's development. However, play is a necessity for all people of all ages. Well-designed play experiences can bring different benefits to the players physically, cognitively, emotionally, and socially, regardless of the players' ages and abilities. Studies show that those who continue to play even in adult life most likely live healthier, while those who ignore playing or are deprived of playing may negatively impact their lives. Inclusive playground is not a new subject, but more often than not, it is focused on providing play experiences with adjustments to play equipment to include children with disabilities. Through applied research and the development of a systematic design approach, this paper attempts to expand the inclusiveness so that the majority of people can enjoy equitable play experience regardless of their condition and age. Through research, exploration, and development of play experiences with playground equipment and site amenities, we hope that would bring benefits of play to the users. The importance of play for all will first be discussed. Then, the design approach evolved from several design classes in developing an inclusive play experience for a broader range of users through collaborating with the industry for the play and recreation market will be introduced.

Keywords: Benefit of Play, Inclusive Playground, Playground Equipment, Design Approach

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## **1. Introduction**

It is a known fact that play is essential for all children. Maria Montessori believed that play is the work of the child. (Maria Montessori, n.d.) So, there is no doubt that children need to play. In recent years, there have been more concerns about the need for play for children with disabilities, and inclusive playgrounds recently become a great interest in the playground industry. However, different studies show that play is not just for children but for all people of various stages in life. Therefore, inclusive playgrounds should not be only focused on children with physical disabilities but instead on a broader spectrum of users. Having worked with the playground industry for almost two decades, we witnessed how the industry has improved to provide equipment for children with disabilities to play in the same playground with those children who have no physical hindrance. For the past two years, collaborating with PlayCore in a design studio class, we have studied and developed inclusive play experiences for playground users. We have learned that there is a much larger scoop of inclusiveness that needs to be addressed. Through applied research and the development of a systematic design approach, this paper attempts to expand the inclusiveness of playgrounds so that most people can enjoy equitable play experiences regardless of their condition and age. Through research, exploration, and development of play experiences with playground equipment and site amenities, we hope that would bring benefits of play to the users. This paper will first discuss the importance of play for all. Then, the design approach evolved from several design classes, developing an inclusive play experience for a broader range of users through collaborating with the industry for the play and recreation market.

## **2. Importance of Play**

### **2.1 Importance of Play for Children**

Play is crucial for children's development. It helps improve their cognitive, physical, social, and emotional well-being. Through play, children learn about the world and themselves. They also learn skills they need for study, work, and relationships, such as confidence, self-esteem, resilience, interaction, social skills, independence, curiosity, and coping with challenging situations. Physical play helps children develop good physical fitness, agility, stamina, coordination, and balance, such as running, skipping, and riding a bicycle. Playing in a group can help children develop their social skills with others by listening, paying attention, and sharing play experiences. This allows a child to explore their feelings, develop self-discipline, learn how to express themselves and work out emotional aspects of life. ("How Play Helps Children's Development," n.d.) Just from a simple play of tree climbing, children learn about gravity, material strength, strategizing the path to get higher and faster, helping one another, and the willingness to take risks. Doris Bergen, a professor at Miami University, once said, "Play is one of the main ways that children really consolidate their learning. The way we really make our skills permanent and enriched and highly developed is often through our play experiences" (Mader, 2022).

### **2.2 Importance of Play for All Ages**

Play is vital for grown-up children. Deprivation of play may affect one's character while interacting with others and their view of the outside world. Dr. Stuart Brown, a pioneer and the founder of the National Institute for Play, believes that we humans are built to play and built by play (Our Founder - National Institute for Play, n.d.).

In 1966, when psychiatrist Dr. Stuart Brown was assigned to a commission to investigate what led University of Texas student Charles Whitman to kill 12 people in one of the country's first mass shootings ... Brown was struck by one other factor that came up in the commission's discussions: Whitman had experienced play deprivation, or an "almost complete suppression of normal play behavior," as the commission put it while growing up. In the years after the shooting, he (Brown) and a team of researchers interviewed men who were incarcerated in the Texas Huntsville Prison for homicide. When the researchers compared information about the inmates' childhoods with a population outside the prison, they found that the comparison group could provide abundant examples of free play in childhood, while the group inside prison largely could not. "The parallelism between their play deficiencies and the objective problems in forming trusting social bonds with others seems very significant," concluded Brown in a 2018 article.

"The adaptive tolerance and empathy toward others that is learned in early preschool through rough and tumble play is really a fundamental part of our having tolerance for people who are different than we are," Brown said.

"The presence or absence of play, particularly in child development, has a great deal to do with competency, resiliency, emotional health [and] brain size," Brown said. Play is "not frivolous and not just for kids, but something that is an inherent part of human nature." (Mader, 2022)

Although it cannot be proven that there is a definite correlation between play deficiency and how a person behaves in social settings, it does shed some light on the importance of play, even in the adolescent stage. Humans need to play because it is part of our nature.

### **2.3 Importance of Play for the Elderly**

There are studies to show that play is beneficial for older adults and can keep them physically, mentally, and socially healthy. Even older adults need to play.

In addition to the hormones released when there is a playful and pleasurable activity, games can be useful to cause mental stimulation, improve well-being, and increase self-esteem whenever a gamer defeats an opponent or wins an obstacle. Games can also improve the motor coordination of old people. (Cota et al., 2015)

Many older adults develop cognitive problems as they age, especially when living alone. It has been found that integrated play therapy for older adults is effective in increasing cognitive functions and decreasing depression levels of older adults who live alone. (Kil et al., 2019) Sound cognitive functions and mental health are essential to lead a quality elderly life, and play can be part of the remedy for enjoyable aging.

### **3. Inclusive Play Experience**

Inclusive playground is not a new subject. In recent years, more parks have been labeled as inclusive parks that try to expand the park for children with disabilities, especially children using wheelchairs. However, most inclusive play playgrounds are mainly focused on children. Some equipment provides play experiences for children with disabilities but isolates

the users from other non-physically challenged children. It is like an invisible label to emphasize that the users have disabilities.

Moreover, almost all the inclusive playgrounds are designed for children. If all people in every stage of life need to play, the current inclusive playground is not inclusive enough, first equity in terms of play experience, and second in terms of different stages of life. Would it be better to have play equipment that most people can play with and have an equitable play experience without being singled out and labeled for disabilities or older adults?

### **3.1 Inclusive Play Design Principles**

On the National Recreation and Park Association website, we can find some inclusive play principles to help designers and manufacturers consider inclusiveness, which include equitable use, flexibility in use, simple and intuitive use, perceptible information, tolerance for error, low physical effort, and size and space for approach and use. (Ruane, n.d.) From the Gametime website, we can also find another set of 7 principles of inclusive playground design that playground equipment needs to be fair, included, smart, independent, safe, active, and comfortable. (The 7 Principles of Inclusive Playground Design, n.d.) These principles are good indexes for designers, but there is no tangible guideline to base on or evaluate if the principles have been reached.

### **3.2 Facts Relevant to Designing Inclusive Play**

We found some facts relevant to inclusiveness to help see the need for design consideration:

- 25% of the world population is under 15 years of age. - World Health Organization, 2022
- There are 6.7 Millions of school-age children with disabilities - U.S. Department of Education, 2019
- There are over one billion people with disabilities in the world, which is nearly 15% of the world's population. - World Health Organization, 2018
- There are over 56 million adults ages 65 and older live in the United States, accounting for about 16.9% of the nation's population -U.S. Census Bureau, 2022
- 10% of the world population is over 65 years of age. -World Health Organization, 2022
- Nearly 40% of grandparents provide childcare for their grandchildren. -Grandparents: A Critical Child Care Safety Net

From Billings Parks and Recreation's website, we found a diagram reviewing the statistics of different disabilities among 1000 children. Out of the 1000 children between 3 to 21, about 85 children have disabilities. (Figure 1) According to the diagram, only one has a physical disability. In contrast, the rest, 84 children, have cognitive disabilities, communication disabilities, social and emotional disabilities, chronic health conditions, multiple disabilities, and sensory disabilities. If inclusive play design addresses only physical needs, many who have disabilities would still not be able to enjoy the play experience.

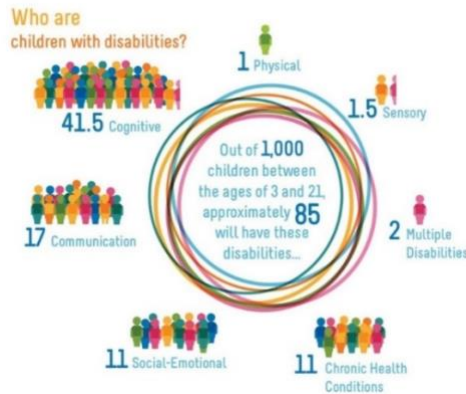


Figure 1: Different disabilities among 1000 children. (<https://www.billingsparks.org/parks-trails/playgrounds/>)

### 3.3 Needs From Different Special-Need User Groups

The needs of different user groups can be identified and summarized through research. The following are some groups we studied, and their characteristics related to design are highlighted. This paper will not discuss the design consideration of each highlighted issue because of the limited space (Figures 2, 3, 4, 5).

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| <p><b>Autism Spectrum Disorder</b></p> <ul style="list-style-type: none"> <li>• Social interaction and communication skills are challenging.</li> <li>• <b>OCD</b> is a very common behavioral characteristic.</li> <li>• Extremely <b>sensitive</b> to sensory experiences.</li> <li>• <b>Muted color tones</b> and <b>straight forward activities</b> help to alleviate stress.</li> <li>• <b>Red and yellow</b> are colors that should be avoided and are known to elicit negative reactions</li> <li>• <b>Physical activity reduces</b> maladaptive behaviors, and has positive effects on social skills and behavior</li> </ul> | <p><b>ADHD</b></p> <ul style="list-style-type: none"> <li>• Trouble <b>sitting still</b>,</li> <li>• Take <b>unnecessary risks</b></li> <li>• <b>Accident</b> and injury prone</li> <li>• Trouble taking turns</li> <li>• Issues <b>staying focused</b></li> <li>• <b>Forgetful</b> tendencies</li> <li>• Difficulty organizing or finishing tasks</li> </ul> <p><b>Positive Stimuli:</b></p> <ul style="list-style-type: none"> <li>• <b>Music</b> and playing instruments,</li> <li>• <b>Outdoor</b> activities reduces the severity of ADHD symptoms</li> </ul> | <p><b>Down Syndrome</b></p> <ul style="list-style-type: none"> <li>• Can affect communication, social, and motor skills.</li> <li>• Personal <b>safety</b> is of upmost importance.</li> <li>• They do not like to stand out from everyone else.</li> <li>• <b>Simple environments</b> are ideal to reduce stress and improve concentration.</li> <li>• Decreased muscle tone, Delayed physical progression, fine motor skills</li> <li>• <b>Poor Mobility</b></li> <li>• Late speech development</li> <li>• Pronunciation issues</li> <li>• Hearing issues</li> <li>• Language and reading</li> </ul> |
|--|--|--|

Figure 2: Characteristics and needs of ASD, ADHD, and DS.

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| <p><b>Depression Disorders</b></p> <ul style="list-style-type: none"> <li>• About 9% of Americans adults 18-65 and 4.4% of children 6-17 have been diagnosed with depression symptoms.</li> <li>• Self care including <b>physical activity and outdoor environments</b> are proven to help relieve symptoms.</li> <li>• <b>Exposure to sunshine</b> and relaxing environments promote healing.</li> </ul> | <p><b>Sight Impairment</b></p> <ul style="list-style-type: none"> <li>• Ranges from color blind, partial impairment, to fully blind.</li> <li>• Color and light intensity is important for the entire spectrum.</li> <li>• Navigate environments <b>with hands and assistive devices</b>.</li> <li>• Visually impaired children develop through <b>sensory experiences with their hands</b>.</li> </ul> | <p><b>Hearing Impairment</b></p> <ul style="list-style-type: none"> <li>• The loss of hearing means people rely on sight to navigate environments.</li> <li>• People with hearing impairment prefer to situate themselves to <b>view who and what is always taking place</b> in the environment.</li> <li>• They feel safer in <b>open environments</b>.</li> <li>• Balance comes from the inner ear and thus important for developing kids.</li> </ul> |
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Figure 3: Characteristics and needs of depression, sight, and hearing impairment.

### Mobility Limitations

- Electric and conventional wheel chairs, walkers, and assistive scooters.
- Wheeled devices severely limit mobility in outdoor recreational spaces.
- **Hard surfaces such as sidewalks and walkways** provide ample space for movement.
- **Handrails and ramp features** should be considered in all designs.

### Seniors

- One third of seniors live with severe **muscle loss**, which can lead to hormone problems, a decrease in the ability to metabolize protein, and other problems.
- Common age-related conditions:
  - Heart Disease
  - Stroke
  - High Blood Pressure
  - Cancer
  - Diabetes
  - Parkinson's
  - Dementia
  - COPD
  - Arthritis
  - Osteoporosis

### Seniors (cont.)

- About **36 million seniors** fall each year
- Falling is the leading cause of death in older Americans
- **Regular exercise reduces:**
  - The risk of developing Alzheimer's disease or dementia by nearly **50%**.
  - The likelihood of falling by **23%**.

Figure 4: Characteristics and needs of mobility limitations and older adults.

### Seniors (cont.)

- According to a new study of 2,000 adults conducted by One Poll and commissioned by Cineworld, more than **50%** of the respondents queried believe that it becomes harder and harder to find enthusiasm in everyday life after you become an adult. More directly estimating that life is **the least fun after the age of 45.**

### Seniors (cont.)

- Nostalgia, is defined by Merriam Webster as a noun referring to a feeling: "a wistful or excessively sentimental **yearning for return** to or of **some past period** or irrecoverable condition."
- One method that has received much attention in the treatment of Alzheimer's behaviors in recent years is the **utilization of nostalgic environments using sounds, scenes, props and music from the person's past, to evoke a feeling of nostalgia.** These environments have been shown to soothe some of the dementia behaviors.

### Seniors (cont.)

- It's just not disease that affects old age; there are various other issues that govern the **downfall of the health** of the old people. One of the main issues is the **negligence from the younger generation.** Old people need supervision, the laxity to understand the needs and worries of elders make them appear strangers to the younger generation, who later regard them as a burden.

Figure 5: More characteristics and needs of older adults.

## 4. An Approach for Designing Inclusive Experience

Our design approach to developing inclusive play experiences has evolved through several design studio classes and has become an integral part of the design process. (Figure 6) The design process will be demonstrated in the following with some examples. The final design solutions will not be shown in this paper owing to the commercial constraints of the collaboration agreement.

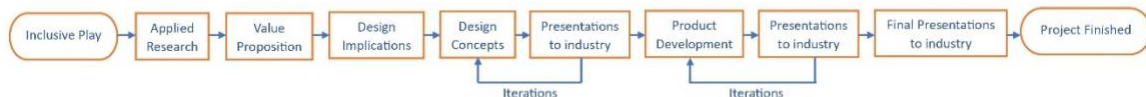


Figure 6: A flow chart of the design process.

### 4.1 Applied Research

In brief, the process begins with identifying research topics we must focus on. The class gets together using Post-it notes to brainstorm all relevant issues we think are essential. (Figure 7) The issues were divided among groups to conduct some applied research on the needs of different user groups and purposes.

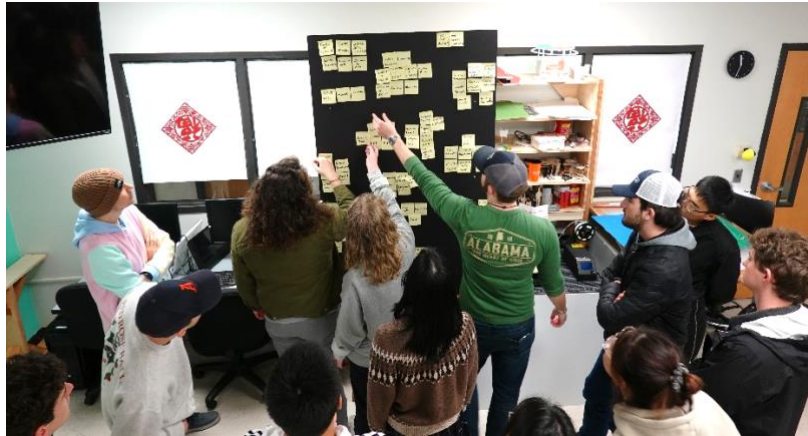


Figure 7: Identifying research issues.

## 4.2 Value Proposition

From the research, keywords, and phrases that are agreeable for the class to focus on during the design phase were listed on the board. Using the selected keywords, the class developed a Value Proposition statement to set the team's design criteria to follow (Figure 8).

Value Proposition

“We are designing inclusive and intergenerational play experiences, promoting diversity, and providing social, emotional, cognitive, and physical development through an environment that fosters community.”

Figure 8: Value Proposition.

## 4.3 Design Implications

Design implications from each research issue were created and visualized in a poster format for designers to reference as they develop concepts for inclusive play experiences. Throughout the concept development stage, each design concept must fulfill the needs of multiple user groups by implementing some of the design implication boards (Figure 9).

Figure 9: Some design implication boards

#### 4.4 Design Criteria

From the research, a list of design criteria was developed for each design concept to follow. Each design concept will be judged on how much it has accomplished the requirements in the criteria. The goal is to meet all criteria, but for some design concepts, it may be impossible to do so. Below is the list of criteria:

- Must allow multiple user groups to play according to research findings
- No labeling play for a specific disability
- Equitable play experience – to include but not to lower the level of fun
- Equitable sensation and challenge of play – the feel and thrill
- Encourage social interaction and cooperation
- Encourage intergenerational play
- Create cozy spots when possible
- Encourage sensory play

#### 4.5 Concept Presentation

Concept presentations were made to the industry and compliance experts to ensure that design concepts are feasible, viable, and usable. Iterations of new ideas and refinements continue for several weeks, with weekly presentations to the industry in person and virtually (Figure 10).



Figure 10: Design sketches and presentation.

#### 4.6 Product Development

Once collaborative efforts select design concepts, product development begins, focusing on the usability, feasibility, and viability of each product we develop. At the end of the semester, design solutions were presented to the industry representatives simultaneously, both in person and online (Figure 11).





Figure 11: Final presentation.

## 5. Conclusion

Play is essential and is for everyone. The lack of play is unhealthy physically, cognitively, emotionally, socially, and mentally. Inclusive play design must continue to be studied and defined for a broader audience/users. Actual inclusive play should not be focused only on physical needs but should be considered more for other disabilities. A well-designed inclusive playground brings everyone to play, thus building a community. Further study needs to concentrate on inclusive play for young and mature adults. Finally, intergenerational play should be more developed because it may help older adults stay active again.

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