

## *Cultural Aesthetics in Inclusive Playground Equipment Design*

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### **Abstract**

Most designs of inclusive playgrounds and playground equipment focus on expanding the user group to include users with various disabilities. There is also a trend to diversify the age group from children and young people to adults and senior users with the hope that the playground is not only for children and young people but also for all people of different abilities and ages so that everyone may attain an equity play experience. As we attempt to design for inclusion, culture is often overlooked. There is a recursion that design produces culture, which, in return, impacts design. Implementing cultural aesthetics to playground equipment design opens opportunities for unique design and brings users familiarity. Designing inclusive playground equipment with cultural aesthetics can also bring awareness of cultural diversity and sustainability. Through a study abroad program visiting Taiwan for two months, an experimental design project was assigned to industrial design students from two schools of different cultural backgrounds to develop inclusive playground equipment that applies cultural aesthetics in the design. Through research, students study diverse user groups and identify objects representing a specific culture, namely, Taiwanese. Through the collaboration of the two groups of students in five teams, five pieces of playground equipment with cultural aesthetics were systematically developed. The project not only facilitates students in exploring different possibilities of applying cultural aesthetics to design appropriately but also helps students learn about the importance of culture in design.

Keywords: Inclusive Design, Play Experiences, Cultural Preferences

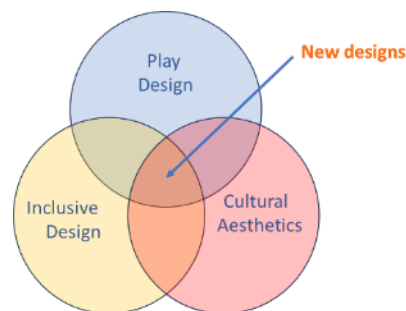
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## Introduction

This paper is a documentation of a Study Abroad industrial design studio class conducted in Taiwan attempting to incorporate Cultural Aesthetics to inclusive playground equipment design. The project includes research on Taiwan's culture, inclusive design considerations, and play experiences design, as shown in Figure 1. It is hoped that incorporating cultural aesthetics would help expand the inclusiveness of users' play experience.

Figure 1: The Project Focus



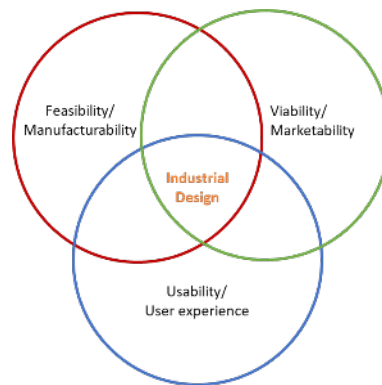
A group of six Auburn industrial design undergraduate and graduate students and a professor spent almost two months in Taiwan, staying at Shu-Te University to experience the culture firsthand and learn design and crafts through working with Shu-Te's professors and students.

Each Auburn student is assigned to 5 to 6 Shu-Te students this year and works as a team on a design project. The result of the design projects is not the program's only goal, though it is tangible evidence of how well the group can work together productively. The design process is an essential part of the interaction within the program. Through the intense and stressful project schedule, with language barriers and discrepant design processes, skills, and tools, students must struggle to communicate, compromise, negotiate, and cooperate with group members. During the process, students learn to deal with people different from them in a working environment, appreciate cultural differences, and take advantage of the combined talents of diverse backgrounds. Working with a design theme of applying cultural aesthetics to design required students to pay more attention to their surrounding culture, thus developing an appreciation of diversity's beauty and importance.

## Industrial Design

Industrial design is a profession that develops products focused on usability (user experience), feasibility (manufacturability), and viability (marketability), as illustrated in Figure 2. Students are trained to identify design problems through research and develop innovative solutions with consideration of the user and stakeholders' experience. Most industrial designers focus on the physical and psychological needs as the foundation of providing the product's usability rather than the cultural needs. However, understanding, acceptability, and familiarity with a design relate somewhat to the users' cultural background. This research project aims to help design students see the importance of cultural influences in design.

Figure 2: The Key Focus of Industrial Design



## Inclusive Playground

Inclusive play has been gaining weight in the playground industry. Most inclusive playgrounds today try to include children with physical challenges and comply with ADA requirements. There is also a social mindset that playgrounds are for children only. Therefore, most inclusive playgrounds are for children. A genuinely inclusive playground should consider users of all ages, abilities, and disabilities. The National Recreation and Park Association (NRPA) website lists seven inclusive play principles. These principles are general guidelines without much detail or criteria. The NRPA's seven inclusive play principles (Ruane, n.d.) are:

1. Equitable use
2. Flexibility in use
3. Simple and intuitive use
4. Perceptible information
5. Tolerance for error
6. Low physical effort
7. Size and space for approach and use

The Gametime website also provides seven similar principles for inclusive play design. The Gametime seven inclusive play principles (The 7 Principles of Inclusive Playground Design, n.d.) are:

1. Be fair
2. Be included
3. Be smart
4. Be independent
5. Be safe
6. Be active
7. Be comfortable

As mentioned, most inclusive playground designs try to include users with physical disabilities. From the Billings Parks and Recreation's website, a diagram reveals the statistics of different disabilities among 1000 children. As shown in Figure 3, out of 1000 children between 3 to 21, about 85 have disabilities. 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.

Figure 3: Disabilities Among 1000 Children

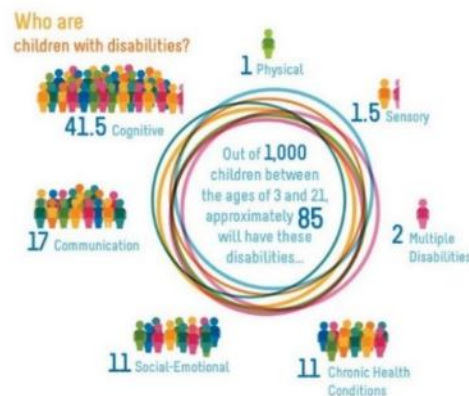


Image Source: <https://www.billingsparks.org/parks-trails/playgrounds/>

If inclusive play design addresses only physical needs, many who have other disabilities would still not be able to enjoy the play experience. There is a need for more design for users with different disabilities. Inclusiveness should not be limited to physical needs but also psychological, social, emotional, and even cultural needs. Design should enhance the play experience by incorporating and considering users of different age groups, abilities, disabilities, and cultural considerations so that all can play on the equipment without compromising the fun and functions of the product. Specific user groups have their particular needs. If a design can fulfill the needs of multiple user groups, it will be a better inclusive play equipment.

Although inclusive play is an important subject, this research project focuses more on cultural aesthetics and its application to design.

## Cultural Aesthetics

Cultural aesthetics is the concept that cultural beliefs, practices, and history shape artistic and sensory values. It describes how a culture's values, expressions, and experiences define its artistic appreciation and expressions. Cultural aesthetics includes visual elements such as colors, patterns, symbols, motifs, and structural and spatial elements such as architectural styles and layout influences. Cultural aesthetics is essential for understanding how cultures maintain their identity and adapt their art forms in the face of change. It also helps us understand how people from different cultures prioritize different visual or auditory attributes. (Magazin et al., n.d.) It is not the goal of this project to conduct a thorough study on the formation of cultural aesthetics but rather an attempt to instill in design students an understanding of the importance of culture in design. Therefore, this paper is not a survey of cultural aesthetics but more of an approach to applying the visual elements considered part of cultural aesthetics to design.

Incorporating cultural aesthetics into design may bring cultural sustainability. Applying cultural aesthetics to design, on the one hand, helps users pass down their culture to the younger generations; on the other, it brings interest to those who are foreign to the culture. For the designer, incorporating cultural aesthetics enhances their understanding and appreciation of the beauty of a specific culture, whether it is for their own culture or designing for another culture.

When a design possesses cultural elements, it will be familiar to the users, thus identifying and understanding it intuitively. A product that users can identify and understand brings attachment and appreciation. In terms of usability, it is an enhancement of the product.

For those who enjoy traveling, experiencing different cultures and scenery is essential. Likewise, diversity in design is vital to the users. Diversity is celebrated in design through the uniqueness of various forms, functions, and even cultures. Therefore, considering cultural aesthetics in design is essential, especially when the world is becoming increasingly homogenous through technology.

Cultural aesthetics can also enhance the inclusiveness of a product. Applying cultural aesthetics can bring familiarity, which is especially beneficial for some neurodivergent individuals. Studies suggest that familiarity may help children with autism in socio-emotional functions. (Nuske et al., 2014; Pierce, 2004).

When prompted with "Can familiarity have positive effects on neurodivergent children?" the ChatGPT-generated text indicated that familiarity can have a significant positive effect on neurodivergent children (children with conditions like autism spectrum disorder (ASD), ADHD, dyslexia, and other neurodivergent traits). Familiar environments, routines, and people can help these children feel more comfortable, supported, and engaged in various situations. Familiarity can help reduce anxiety and stress, improve social interactions, enhance learning and development, support emotional regulation, increase sense of identity and belonging, and improve behavioral outcomes (OpenAI, 2025).

In playground design, incorporating familiarity with the users by applying cultural elements to the design may help users with neurodivergence to play in the environment.

### **The Design Project**

This research project aims to conduct a study abroad design studio in Taiwan, which combines students from Auburn University and Shu-Te University with two different cultural backgrounds and design inclusive playground equipment incorporating Taiwanese cultural aesthetics. Taiwanese (Shu-Te) students intentionally incorporate their culture into the design, thus paying more attention to how cultural influence may enhance the design. Auburn students (from the US) would better understand Taiwanese culture through working with Taiwanese students, which enhances their study abroad experience and learn more about Taiwanese culture. Consequently, students from both schools may realize the importance and usefulness of cultural considerations in designing products. Hopefully, the new designs with cultural aesthetics may expand on inclusiveness regarding familiarity, attachment, empathy, cultural sustainability, diversity, and social interaction.

Six students from Auburn University and 28 from Shu-Te University were divided into five design teams to work together for 7 weeks. Each design team has at least one student from Auburn to ensure cultural exchange and English was used in the class. Each design team developed a specific product proposal based on the research conducted.

A design brief was given to each team as follows:

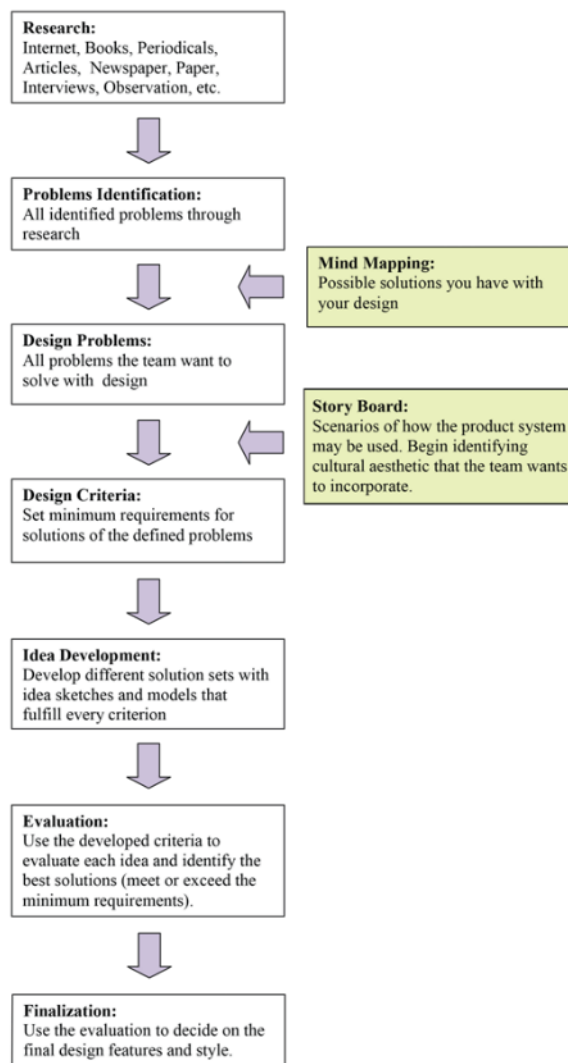
Each group is to develop play equipment that brings enjoyable experiences that bring the users physical, psychological, emotional, and social benefits. The design should contain cultural aesthetics and influence from Taiwan. The equipment must be designed for multi-users. And it should be considered to be inclusive. Before concept development, research on the following topics.

- Child development

- Inclusive design
- Different kinds of disabilities
- Benefit of play
- Taiwanese culture and aesthetics
- The design should mainly focus on mechanical solutions rather than electronic or electrical ones.
- Although the project is focused on physical play, the psychology of the users must be considered.
- Analysis of existing and related products

A design process was presented to the students, as illustrated in Figure 4.

Figure 4: A Flow Chart of the Design Process



The class met twice a week for four hours each class meeting. Besides lectures and assignments, each team worked on the project in discussions and on specific assignments. The collection of pictures in Figure 5 shows different activities during the class. Students also work outside of class time because of the intensity of the tasks, such as research, storyboards,

presentations, sketches, scale models, full-scale orthographic drawings of the final design, final models, etc.

Figure 5: Activities in the Classroom



## Project Outcomes

The following are three examples of how the project turned out. Each group researched different subjects concerning inclusive design, play design, and cultural aesthetics. Based on the research, each group first defined a set of play experiences that the group would incorporate into their design, such as sliding, swinging, climbing, etc. Users with disabilities will be considered for the chosen play experiences to design equitable play. Specific cultural aesthetics were applied to the final design.

*Case 1:* Figure 6 shows that Team 1 incorporated the highest mountain in Taiwan, the banyan tree, bubble tea, pronunciation symbols bopomofo, and the blue magpie as their formal inspirations. The design fulfilled the inclusive aspect by providing a transfer platform for easy access for wheelchair users to get up to the top of the equipment, and the exit of the slide is close to the platform for return. It also provides a more isolated area for certain neurodivergent users to use. The final scale model is shown in Figure 7.

Figure 6: Final Design With Corresponding Cultural Elements As Inspirations

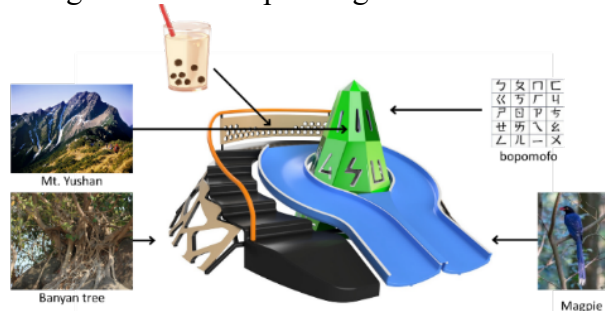


Image Sources:

[Yushan]. (n.d.), <https://pbs.twimg.com/media/Eb7jiVDUEAACyHhE.jpg>

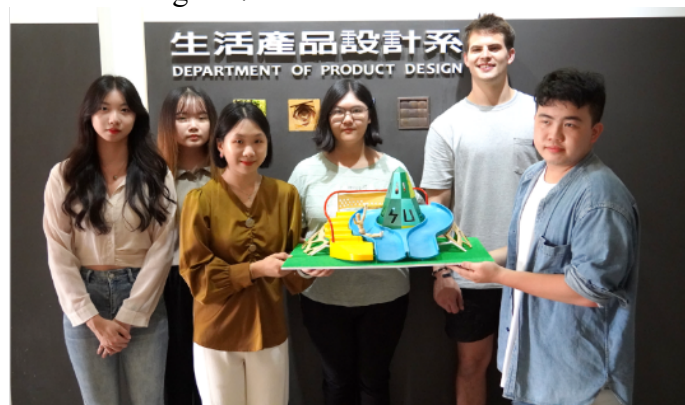
[Bubble tea]. (n.d.), <https://a0.anyrgb.com/pngimg/632/1830/tea-cup-sumikko-gurashi-cup-of-tea-thai-tea-tapioca-nondairy-creamer-masala-chai-soft-serve-bubble-tea-iced-tea.png>

[Bopomofo]. (n.d.), <https://cdn-ak.f.st-hatena.com/images/fotolife/t/tutty527/20210905/20210905161010.png>

[Banyan]. (n.d.), <https://inaturalist-open-data.s3.amazonaws.com/photos/61482411/large.jpeg>

[Blue Magpie]. (n.d.), <https://observation.org/media/photo/22187950.jpg>

Figure 7: Final Model of Team 1



Will Cooper, Hui-En Tee, Yi-Shan Hong, Yu-Chian Wang, Chia-Hsun Yeh, Gek-Jue Phua

The final design was also 3D modeled to create an in-situ picture, as shown in Figure 8.

Figure 8: In-Situ Rendering of the Product Being Used



*Case 2:* Team 2 decided to use elements from the betel nut store, the Taiwan black bear, bubble tea, and roll-up gates, standard in Taiwan (shown in Figure 9), as the aesthetic inspiration for the multi-generational playground equipment they designed. Figure 10 is the scale final model of Team 2, and the in-situ computer-generated rendering in Figure 11.

Figure 9: Cultural Elements Used by Team 2



Image Sources:

[Betel nut store]. (n.d.), <https://ourisland.pts.org.tw/sites/default/files/styles/rk-list/public/field/image/12.JPG>

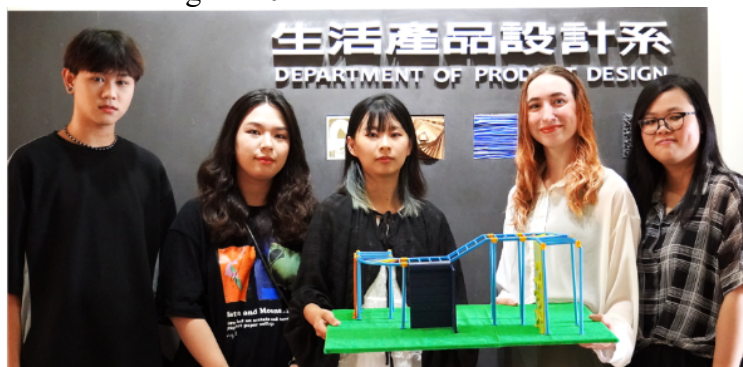
[Black bear]. (n.d.), <https://cw-image-resizer.cwg.tw/resize/uri/https%3A%2F%2Fstorage.googleapis.com%2Fopinion-cms-cwg-tw%2Fckeditor%2F201910%2Fckeditor-5d9ac65e37654.JPG/?w=900&format=webp>

[Roll-up gate]. (n.d.), [https://p2.bahamut.com.tw/HOME/creationCover/71/0005108671\\_B.JPG](https://p2.bahamut.com.tw/HOME/creationCover/71/0005108671_B.JPG)

[Bubble tea]. (n.d.).

[https://c.p02.c4a.im/user/1286435/exhibits/3077929/0\\_8beae16fd09790255c5295dc379eeddb?d=583x585](https://c.p02.c4a.im/user/1286435/exhibits/3077929/0_8beae16fd09790255c5295dc379eeddb?d=583x585)

Figure 10: Final Model of Team 2



Brianna Parmley, Yung-Ying Chang, Chia Ying Tu, Ting-Chieh Chuang, Yu-Jhen Zeng, Xin-Yi Zhong, Chia-Ming Chuang

Figure 11: In-Situ Rendering of the Product Being Used



*Case 3:* Team 3 used a popular dessert, Pengbing (Brown Sugar Bun Cake), as shown in Figure 12, as the aesthetic inspiration for their inclusive playground equipment design. They use the form to develop an inclusive merry-go-round that provides a transfer platform at the entrance and a somewhat isolated space for some neurodivergent users. The final scale model is shown in Figure 13, and the in-situ computer rendering is shown in Figure 14.

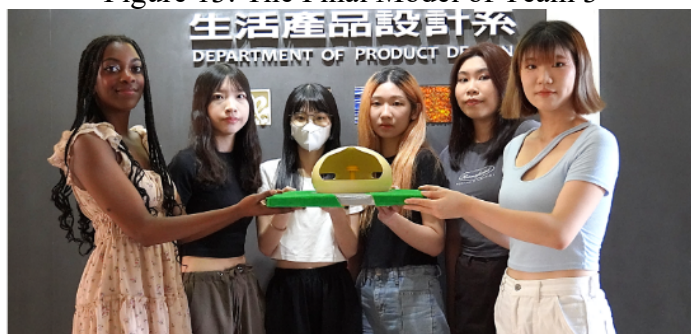
Figure 12: Brown Sugar Bun Cake



Image Sources:

[Pengbing (Brown Sugar Bun Cake)]. (n.d.). [https://scontent-atl3-1.xx.fbcdn.net/v/t39.30808-6/251952759\\_4307792586016599\\_6081926882722821307\\_n.jpg?\\_nc\\_cat=107&ccb=1-7&\\_nc\\_sid=127cfc&\\_nc\\_ohc=Kvp3SolJYZMQ7kNvgFj9HZc&\\_nc\\_zt=23&\\_nc\\_ht=scontent-atl3-1.xx&\\_nc\\_gid=AZggyki2NVsDMCGOJ4fqJU1&oh=00\\_AYDSuCJbPW9MCxMctmb8IJXD232fsGZdvLD6uMCnuOWNIg&oe=67A834C2](https://scontent-atl3-1.xx.fbcdn.net/v/t39.30808-6/251952759_4307792586016599_6081926882722821307_n.jpg?_nc_cat=107&ccb=1-7&_nc_sid=127cfc&_nc_ohc=Kvp3SolJYZMQ7kNvgFj9HZc&_nc_zt=23&_nc_ht=scontent-atl3-1.xx&_nc_gid=AZggyki2NVsDMCGOJ4fqJU1&oh=00_AYDSuCJbPW9MCxMctmb8IJXD232fsGZdvLD6uMCnuOWNIg&oe=67A834C2)

Figure 13: The Final Model of Team 3



Derika Taylor, Yi-Syuan Shih, You-Cih Liou, Yeuk Hon Tam, Yu-Lun Huang, Li-Ling Wang, Yi-Chen Chu

Figure 14: An In-Situ Rendering of the Inclusive Merry-Go-Round



## **Conclusion**

Play is for everyone, and lack of play is physically, emotionally, socially, and mentally unhealthy. Playground designers should continually study and define inclusive play as we promote a playful lifestyle so that more people can enjoy equitable play experiences. We learn that a genuine inclusive playground should not focus only on physical disabilities but also on people with neurodivergence. A well-designed inclusive playground brings everyone to play, thus building a healthy and playful community.

In designing inclusive playgrounds, culture should be considered part of the design for better user experiences. Design students need to pay more attention to culture, cultural aesthetics, and how they could incorporate the cultural aspect in their design. Moreover, cultural aesthetics can add characters and uniqueness to the design, as shown in the projects, and enhance the play experience through familiarity, attachment, empathy, cultural sustainability, diversity, and social interaction. Integrating familiarity with design may help neurodivergent users to adapt to the new design more efficiently, thus enhancing their play experience. Applying cultural aesthetics in Inclusive Playground enhances the sense of belonging, respect, and understanding among users of different backgrounds.

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