

Inclusive Playground for Children with Disabilities to Promote Social Sustainability

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Abstract--- *Playing is a vital component for the development of children in the sense of effectiveness, psychomotor, cognitive skill, social interaction and creativity. All children, including children with disabilities, have the rights to the experience of play towards their development. Disabled children required this even more than others. However, nowadays, children with disabilities often face problems at public playgrounds, entertainment places, and amusement areas, due to the lack of ample provisions to cater to their special needs. Commonly, children with disabilities have physical disabilities that involve difficulties in walking, mobility, sitting, standing, and other significant weaknesses which create the barrier and exclusion between normal children and these disabled children. In Malaysia, there had been no studies on the needs of a proper sustainable design model for public playgrounds to cater to children with disabilities. The challenge ahead for Malaysia is to transform its approach from a welfare perspective to human rights. Based on the hurdles, the research objective was highlighted to identify the criteria of the accessible playground as the guideline of the inclusive playground for children with disabilities to achieve social sustainability. A qualitative method was used for this research that is by observing the condition of an inclusive playground in Penang. The outcomes of this research are expected to assist the stakeholder Municipal Council to influence the inclusiveness of the elements in the playground to attract more children with disabilities to play on the playground thus to widen the social sustainability towards the society.*

Keywords--- *Inclusive Playground, Children with Disabilities, Social Sustainability.*

I. INTRODUCTION

Commonly, children with disabilities in the aspect of physical have difficulties in walking, mobility, sitting, standing, and other significant weaknesses this forms an obvious boundary between the average and the incapable. In Malaysia, the playgrounds have been prepared for children. However, it does not suit for children with disabilities, and they are being denied their rights to use the playground. Among 27 million populations, children who are less than 15 years old can hold up to a total of 900.000 with different disabilities which they need special care and facilities in public areas[1]. In most parts of the developed world, different assessment tools are used to describe the developmental achievement among disabled children.

However, most of the studies are only concentrated on one particular disability and skill area. In Malaysia, there have been no studies into the needs of a proper sustainable design model for public playgrounds to cater to children with disabilities. All playgrounds are not fully accessible and inclusive for children with disabilities to play freely

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[2]. Even though there are some playgrounds which are easy to be accessed for these children, but the playgrounds are not always inclusive for children of all physical and mental abilities [3]. This cause disabled children to feel excluded when they are playing on the current playground. Relating to social sustainability, if the children feel satisfied and have fulfilled their needs towards the inclusive playground, the playground has already fulfilled its social sustainability to children with disabilities. Most of the public playground designs in Malaysia do not meet the demand of the incapability to achieve social sustainability[4]. These demands and requirements cannot be applied to the current playground because there have been no proper guidelines regarding inclusion playground to fulfill social sustainability for disabled children in Malaysia. To allow these children to play safely and securely, the inclusive playground is the one type of playground which is suitable, and it encourages all children including disabled children to engage and communicate with one and another[5]. By offering an inclusive playground, it allows all children to play with other children from different abilities and backgrounds which could help in the development of crucial social, physical, and emotional skills[6].

The issue of children with disabilities with the accessibility problems to the playgrounds is less discussed. The children with disabilities are often faced with problems in public areas, and one of the problematic areas is in public playgrounds[4]. Related with social sustainability, there has been considerably less attention in public dialogue compared to economic and environmental sustainability[7]. The study concluded that most of the public playground designs in Malaysia do not meet the demands of disabled children[4]. Although this is not a new issue, the requirement of social sustainability is still not fulfilled for a playground for disabled children. These issues review falls into two broad categories, which are social issues and technical issues[4]. In Malaysia, there is a playground that has been constructed specially for children with disabilities. Municipal Council of Penang has managed the playground called "Taman Permainan Mudah Akses" or "Accessible Playground" with the initiative by Penang State Government and "Persatuan Sukan dan Rekreasi Orang Kurang Upaya (PESPRON) Pulau Pinang. Based on Director of Welfare Services, Puan Rashidah Binti Jalaluddin, this playground has become the first project in Malaysia since 2013, and hopefully, it could inspire and spark up the other authorities to build this playground for the development of society. Thus, this research aims to recommend the criteria of an inclusive playground to fulfill social sustainability for children with disabilities. The objective of this research is to identify the criteria of an accessible playground, along with the guidelines of an inclusive playground for children with disabilities to achieve social sustainability.

II. LITERATURE REVIEW

Social Sustainability

Social sustainability is a concept to describe a collective understanding of the need to build a community for individuals to thrive with equal access to opportunities for individual development. Social life has developed a framework for social sustainability, which has four dimensions, which are amenities and infrastructure, social and cultural life, voice and influence, and space to grow [8]. Social sustainability is supposed to be offered as an integral part of the development process for children with disabilities in aspect of environment, economic and infrastructure concern[9]. However, this topic has been considerably receiving little attention in public dialogue compared to economic and environmental sustainability[7]. The debate for social sustainability has the least amount of research

throughout the years[10]. This is because social sustainability is more difficult to quantify rather than economic growth and environmental impact [11].

Children with Disabilities in Malaysia

The Persons with Disabilities Act 2008 (Act 685) (PWDA) defines PWDs as people with long-term physical, mental, intellectual or sensory impairments in interaction with various obstacles that hinder them from fully participating in the community or public[12-13]. The total population for people with disabilities is about 409,269 people in every state of Malaysia and Selangor is identified as the state with the highest number of people with disabilities [1]. Children with disabilities are one of the many groups of people that are facing exclusion from society. This group has been denied their right to enjoy the facilities and amenities, including the playgrounds. The social exclusion is occurring among this poor group is they are being excluded from society, and this group is most often separated from other children when kept in special institutions away from their family[14].

Inclusive Playground

The definition of a playground area is a small, publicly owned, outdoor area with recreational equipment and provide physical activities for children[15]. The playgrounds have become an important place and have been created for children to play freely and become a part in recreation and physical activities[16]. However, not all playgrounds are fully accessible and are inclusive for children with disabilities[2]. The fact that playgrounds and play equipment are not designed for children with restricted mobility is becoming an obstacle. For children with disabilities, playgrounds have limited accessibility, usability and did not support interaction with peers[17]. The children with disabilities are often faced with problems in public areas, and one of the problematic areas is in public playgrounds[4]. Their research concludes that most of the public playground designs in Malaysia do not meet the requirements of children with disabilities. To include disabled children to play on the playground, it becomes essential to design and install play environments which contain the playground's components that allow these children to develop their physical, social, sensory, and cognitive skills[14].

The inclusive playgrounds are one of the places where everyone can get to and through the playground[5]. The playground needs to be accessible and inclusive to be welcoming for all children, including children with disabilities[3]. By offering an inclusive playground, it can allow all children to play together even with different abilities and from different backgrounds, which helps to develop crucial social, physical, and emotional skills[6]. Overseas, several countries take one step ahead by initiating this inclusive playground to the public. Also, there are several agencies which cooperate with the local authority to publish the guidelines of an inclusive and accessible playground for children with disabilities. The guidelines from Accessible Play Areas[18] and Inclusive Play Design Guide[19] are published to assist expertise playground and child development in providing the playgrounds which are more inclusive to all children.

III. METHODOLOGY/ MATERIALS

The observation was undertaken upon the Accessible Playground in Georgetown, Penang. This method is to achieve the objective which identifies the criteria of an accessible playground as the guidelines of the inclusive

playground for children with disabilities to achieve social sustainability. There are eight types of equipment which commonly available in the playground, which are swings, slides, see-saws, merry-go-rounds, monkey bars, spring riders, crawl tunnels, and rubber mat[20]. There might also be additional equipment in this playground depending on the suitability and requirements. The data is analyzed based on the observations towards the design and measurement of the equipment of the playground and be referred to the guidelines from Accessible Play Areas[18] and Inclusive Play Design Guide[19]. The outcome of this analysis is to recommend a list of criteria for inclusive playgrounds to achieve social sustainability for children with disabilities.

IV. RESULTS AND FINDINGS

A. Result Analysis

As mentioned in 3.0 Methodology, there is an Accessible Playground in Penang, and this playground has become the case study for this research as shown in Figure 1 below.



Fig. 1: Accessible Playground in Penang

In Table 1 is the list and number of the equipment of Accessible Playground in Penang.

Table I: List of Equipment on the Accessible Playground in Penang

Equipment	Number
Slides	4
Spring Riders	N/A
See-saws	N/A
Monkey Bar	N/A
Merry-go-rounds	N/A
Crawl Tunnels	N/A
Cover/rubber mat	The whole area
*Game Panel	1 set
*Wall Board Games	1 set
*Playhouse	Three sets
*Parallel Walking Bar	1 set

(* Additional equipment)

1. Slides

Figure 2 below shows the condition of the slides for this accessible playground. The height of the slides is shorter than the average slide. The height of this slide is in a range of 2.0 meter. As referred to the Inclusive Play Design Guide, the height of sliding in 2' (or 0.60 meters), 4' (or 1.20 meter) or 6' (or 1.80 meters) [19]. The width of the playground in range 0.60m to 0.90 m based on the size of the children who slides on it. Besides that, near the slide has an area or point for incapable children to retrieve their mobile device and so that they can play the slide easily. The requirement is recommended by the Inclusive Play Design Guide [19].



Fig. 2: Slides in Accessible Playground in Penang

To allow them to play on this equipment, this equipment should provide fewer steps but instead include a ramp or accessible route as shown in Figure 3 below. This ramp, as referred to Accessible Play Areas, may connect with the other elevated play components [18]. The width of the accessible route is 1.30-meter in width, which can allow two wheelchairs to come in and out. The length of the route is about 3 meter, and there is a standing platform to change the direction of the route before arriving at the slide. As referred to the Inclusive Play Design Guide and Accessible Play Areas, the entries and exits onto all accessible routes must be 60" (1.30 meter) or 72" (1.80 meters) in width to allow two wheelchairs to pass each other [18-19].



Fig. 3: Condition of Accessible Routes

This equipment also a Guiding block at the entrance to give help the visually impaired children before playing on this equipment, as shown in Figure 4. For normal children, they can play on this equipment without any obstacles and allow the children with disabilities to play together too. Therefore, this design is suitable and inclusive, which encourages all children to it play together on without any disturbance.



Fig. 4: Guiding Block

2. Cover Mat

In Figure 5 below shows the condition of the cover mats for this accessible playground. The cover mat is applied to the whole area of the playground using a synthetic rubber mat to minimize the injury of the user. The cover mat is a unitary playground surfacing. This type of cover mat will be smooth, seamless and uniform at all surfaces [21]. As referred to the Inclusive Play Design Guide, they also suggest that unitary surfacing is highly recommended for the inclusive playground due to ease the movement of any mobility device to be used on this type of material[19]



Fig. 5: Condition of a Rubber Mat

The rubber mat is also applied on the surface of slides, as shown in Figure 6 below. This type of rubber mat is different from the surfacing playground. This surface of the mat is very rough and suitable to put on the ramp of the slides to avoid any slips happen.

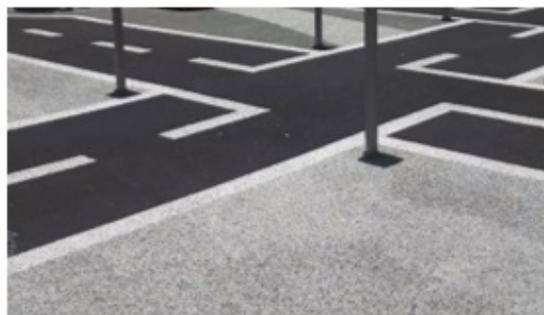


Fig. 6: Type of Rubber Mat On-ramp

3. *Additional Equipment*

These equipment are available on this playground to make it a more interesting experience and to get the children to move with more excitement and delight-fullness. This equipment gives full of purpose which gives benefits to children with disabilities not only for entertainment but also for learning purposes too.

4. *Game Panel*

The game panel has various attractive pictures and designs, plus they have little games such as Tic Tac Toe (XOXO), Match the pictures and to name a few. These games will test their brain and stimulate their mind, too, as shown in Figure 7.



Fig. 7: Condition of Partition

5. *Playhouse*

This playhouse, as shown in Figure 8 below, is used to give them space for the children to play together with their imaginations. This playhouse encourages them to interact with each other and play as a team in play between normal children and children with disabilities. This concept is followed by the Inclusive Play Design Guide, which is to provide opportunities for them to create a play based on the theme given and act them out by participating in various roles[19]. From there, it can also give opportunities for children with disabilities to interact together and to be involved in the social circle.



Fig. 8: Playhouse

6. *Wall Board Games*

The board, as shown in Figure 9, is used to increase their sensory play to master life skills. Killing two birds with one stone as they would always say, as the children are playing at the same time they are learning something new.

There some games being put, such as follow the line to test their hand movement and how they could get the object to the specified dot through the maze. The wallboard games in the Accessible playground in Penang also has an alphabetical braille board so that they can also learn not just inside the classroom but outside of the classroom too.



Fig. 9: Wall Board Games

7. *Parallel Walking Bar*

The Parallel walking bar helps to practice children with physical disabilities to practice on their walking. This equipment, as shown in Figure 10, is used to train them to walk slowly with adults' supervision. With the help of nature and fun surrounding, the children will feel more encouraged to try to walk and give less pressure for them to develop their abilities too.



Fig. 10: Parallel Walking Bar

8. *Not Applicable Equipment*

Below are the lists of equipment which are not applicable in this accessible playground. These equipment are not being put and prepared by the authority due to several factors. Based on Director of Welfare Services, Puan Rashidah Binti Jalaluddin, these equipment are not suitable to be placed on this playground because of the limit in placing this equipment. This equipment should be placed in a wider area to avoid any possible accidents happening that can agitate the process of play on this equipment. The other factor is the suitability of this equipment. There will be children with disabilities, and these children would be unable to play this equipment due to its limit of physical abilities and movement.

9. Swings

One of the most go-to adored equipment is the swings. This type of equipment gives full enjoyment and excitement when playing. However, this equipment does not apply to this playground since the swings need adequate space and a wide area to avoid injuring any child who would be likely to play around and while other people are playing.

10. Monkey Bar

Monkey bars are good in terms of developing the strength of the muscle. In contrast, children are most likely to get a blister from the effects of crossing from one bar to the other, particularly on a sunny day. Due to safety and to prevent any worst injuries from happening, monkey bars will not be considered to be put as a part of the equipment on the playground. Moreover, the enjoyment of playing this could not be shared with children with disabilities particularly the ones with physical incapability.

11. Merry go Round

Merry go round are one of the all-time favourites in the playground. On the contrary, this equipment is not eligible for the modern playground because of the possibility to get an injury is high and not safe for most children. Supervision of adults is highly needed.

12. Play Tube/ Crawl Tunnels

These tubes also one of the basic equipment for the playground. This equipment is not applicable because of the limit of space since the size of one set sliding is big due to the long length of the ramp and the wideness of the width.

13. Spring Riders

Spring riders also one of the basic equipment for the playground. This equipment is not likely to be applied because of the limit of space in the area of the playground.

V. DISCUSSION

Referring to the guidelines from Accessible Play Areas and Inclusive Play Design Guide, the specification and dimension of each playground is mostly similar and followed. Based on observations for all equipment of Accessible Playground in Penang, that most of the equipment on the playground can participate all children to play without any complications. This is due to the form and type of equipment that is almost similar to the equipment of the average playground, and the children are familiar with the use of the equipment as in how to play with and on it. The condition of the playground is safe and secure due to the using of rubber mat for surfacing to reduce the risk of the injury. By means, the parents have no worries regarding the safety of their child in the play area. Besides that, this equipment also gives opportunities for a normal child and a child with disabilities to play, interact and communicate together. Thus the equipment of the playground has the element of inclusiveness and universal in part of the design, which can allow all children to connect through play. For children with disabilities, this equipment will give them the feel of availability and the convenience to play on the playground. With these references, it can

become the benchmark and guidelines for other parties before creating and constructing the playground so that we can allow this unfortunate but extra need of care group of people to play outside like any other common children and also avoid any feeling of dismissal happen in society.

VI. CONCLUSION

Based on the analysis shown that most of the equipment in the Accessible Playground in Penang achieved the objective of this research. The equipment is able for all children, including children with incapability to play together without any exclusion between them. The measurement and specification of each equipment also referred to the guidelines from overseas, and it seems eligible to be applied in Malaysia. From this observation and survey, we hope that other authorities could follow the steps of Municipal Council in Penang to implement this inclusiveness design of the playground to the public and to avoid any social exclusion happening and also to create an environment which achieves social sustainability to the society.

REFERENCES

- [1] Jabatan Kebajikan Masyarakat. (2016). Laporan Statistik Jabatan Kebajikan Masyarakat 2016. [online] Available at: <http://www.jkm.gov.my/jkm/uploads/files/penerbitan/Buku%20statistik%202016.pdf> [Accessed 1 Feb. 2019].
- [2] Rickhansen.com. (2019). Creating Inclusive Play Spaces For Children Of All Abilities. [online] Available at: <https://www.rickhansen.com/sites/default/files/downloads/letsplaytoolkit.pdf> [Accessed 2 Feb. 2019].
- [3] No Fault. (2018). Accessible or Inclusive? Playgrounds for Everyone Go Beyond ADA – No Fault. [online] Available at: <http://nofault.com/2018/04/accessible-or-inclusive-playgrounds-for-everyone-go-beyond-ada> [Accessed 2 Feb. 2019]
- [4] Soltani, S.H.K., Abbas, M.Y., & Awang, M. (2012). Disabled children in public playgrounds: A pilot study, *Asian Journal of Environment-Behaviour Studies*, 3(8), 15-26. [Accessed 2 Feb. 2019].
- [5] Kaplan, M. (2013). Accessible vs. Inclusive. [online] *Playgroundprofessionals.com*. Available at: <https://www.playgroundprofessionals.com/playground/accessibility/accessible-vs-inclusive112> [Accessed 2 Feb. 2019].
- [6] Playgrounds. (2019). Inclusive Playground Design. [online] Available at: <https://srppplayground.com/inclusive-playground-design> [Accessed 2 Feb. 2019].
- [7] Mamta, K. (2016). Social dimension of sustainable development. *ACADEMICIA: An international Multidisciplinary Research Journal*, [online] 6(3), pp.275-279.
- [8] Bonnefin, I. (2017). Social Sustainability and the Public Realm. [online] *Certifiedenergy.com.au*. Available at: <https://www.certifiedenergy.com.au/blog/social-sustainability> [Accessed 2 Feb. 2019].
- [9] Batchelor, D. (2017). Creating social sustainability. [online] *Architecture Now*. Available at: <https://architecturenz.co.nz/articles/creating-social-sustainability/> [Accessed 2 Feb. 2019].
- [10] Brain, J. (n.d.). The Social Side of Sustainability. [online] Available at: https://www.planning.org.nz/Folder?Action=View%20File&Folder_id=185&File=Brain.pdf [Accessed 29 Mar. 2019].
- [11] McKenzie, S. (2004). Social Sustainability: Towards Some Definitions. Hawke Research Institute, [online] 27. Available at: https://s3.amazonaws.com/academia.edu.documents/37435106/background_about_sustainability.pdf?AWSAccessKeyId=AKIAIWOWYYGZ2Y53UL3A&Expires=1553875878&Signature=eaqZZ2DGqU8rj5d0dzibm4XcrMc%3D&response-content-disposition=inline%3B%20filename%3DSOCIAL_SUSTAINABILITY_TOWARDS_SOME_DEFIN.pdf [Accessed 29 Mar. 2019].
- [12] Ismail, A.M., Marzuki, M., Daud, M.N. & Borham, A.H. (2015) Provision of Facilities for Persons with Disabilities (PWDs) in the Mosques: A Case Study in Mosques District of Batang Padang. *Al-Hikmah*, 7(1), 62-78 [Accessed 2 Feb. 2019].
- [13] Kaur, G., Leong, T.P., Yusof, J.M. & Singh, D. (2015) Perception of People with Disability in Creating Sustainable Public Policy. *Social and Behavior Sciences*, 168, 145-155 [Accessed 2 Feb. 2019].
- [14] Humanium. (2019). Disabled children - Humanium. [online] Available at: <https://www.humanium.org/en/disabled-children/> [Accessed 1 Feb. 2019].

- [15] Russell, L. (2011). The Potential of Safe, Secure and Accessible Playgrounds to Increase Children's Physical Activity. [Online] Available at: http://activelivingresearch.org/files/ALR_Brief_SafePlaygrounds_0.pdf [Accessed 6 May 2017].
- [16] Mani, M., Abdullah, A., Mustafa, R., Jayaraman, K. & Bagheri, A. (2012). The Importance of Well-Designed Children's Play-Environments in Reducing Parental Concerns. *Middle-East Journal of Scientific Research*, 11(9), pp.1176-1184. [Accessed 2 Feb. 2019].
- [17] Talay, L., Akpınar, N. & Belkayali, N. (2010). Barriers to playground use for children with disabilities: A case from Ankara-Turkey. [online] Research Gate. Available at: https://www.researchgate.net/publication/228495689_Barriers_to_playground_use_for_children_with_disabilities_A_case_from_Ankara_Turkey [Accessed 27 May 2018].
- [18] Access-board.gov. (2005). Accessible Play Areas. [online] Available at: <https://www.access-board.gov/attachments/article/1369/play-guide.pdf> [Accessed 13 Apr. 2019].
- [19] Accessibleplayground.net. (2015). Inclusive Play Design Guide. [online] Available at: <https://www.accessibleplayground.net/wp-content/uploads/2016/05/Inclusive-Play-Design-Guide-LowRes-2.pdf> [Accessed 13 Apr. 2019].
- [20] Kim, H. (2017). Names of Playground Equipment | AAA State of Play | Commercial Grade Equipment. [Online] Aaastateofplay.com. Available at: <http://www.aaastateofplay.com/names-of-playground-equipment/> [Accessed 6 May 2017].
- [21] David & William Associates (2015). Comparing Playground Surfacing Types | How to pick Playground Surfacing. [Online] Davidwilliamsassociates.com. Available at: <http://www.davidwilliamsassociates.com/node/303> [Accessed 6 May 2017].