



UNIVERSITI
TEKNOLOGI
MARA

Cawangan Perak

e-Proceedings

V-GOGREEN2021

29-30
SEPT

VIRTUAL GO GREEN: CONFERENCE AND PUBLICATION

“Rethinking Built Environment: Towards a Sustainable Future”



Organiser:
**Research, Industrial Linkages, Community
& Alumni Network (PJIM&A)**

Co-organiser:
**Department of Built Environment Studies & Technology (JABT),
Faculty of Architecture, Planning & Surveying (FSPU)**

PUBLICATION DATE: 1st JUNE 2022

e-Proceedings

V-GOGREEN2021 ²⁹⁻³⁰
SEPT

VIRTUAL GO GREEN: CONFERENCE AND PUBLICATION

“Rethinking Built Environment: Towards a Sustainable Future”

Organiser:

**Research, Industrial Linkages, Community
& Alumni Network (PJIM&A)**

Co-organiser:

**Department of Built Environment Studies & Technology (JABT),
Faculty of Architecture, Planning & Surveying (FSPU)**

Best Practice Criteria of Inclusive Playground Equipment for Children With Disabilities (CWD)

Raja Mohd Aizat Akhmal Raja Mohd Rozuan¹, Kharizam Ismail¹ and Wan Rabiah Wan Omar²

¹*Department of Quantity Surveying, Faculty of Architecture Planning and Surveying, Universiti Teknologi MARA (UiTM), Seri Iskandar, Perak, 32610, MALAYSIA*

²*Department Town Regional & Planning, Faculty of Architecture Planning and Surveying, Universiti Teknologi MARA (UiTM), Seri Iskandar, Perak, 32610, MALAYSIA*

aizatakhmal.rozuan@gmail.com

Abstract

One of the important elements in children's development is playing where they interact, develop communication skills, build self-confidence, maintain and improve health conditions, and so forth. All children including children with disabilities have equal rights to enjoy playing with friends during their childhood development. In supporting this need, the government has made it compulsory for local authorities to ensure their area of jurisdiction is provided with public playgrounds. Unfortunately, it was found that most of these public playgrounds did not support the special needs of children with disabilities (CWD). Hence, the precious childhood play experience for children with disabilities was found to be very limited. In Malaysia, there is a dearth of research on the needs of public facilities of playgrounds especially for play equipment suited for children with physical disabilities. The Social Welfare Department in 2020 stated that Selangor has recorded 16% of their children are physically disabled and this figure is the highest among all the states in Malaysia. Due to this situation, this particular study is focussing on developing best practice criteria in the design of inclusive playground equipment that can be enjoyed by all children including CWD. This research applied the quantitative approach whereby data were obtained using a questionnaire survey distributed to parents and caretakers of children with disabilities in Selangor. The collected data was analyzed using Mean Rank Analysis. Results show that there are five main criteria namely usable equipment, sufficient space, reachable height, safe play material, and helpful features of play equipment as best practice elements in providing friendly, accessible and safe playground equipment for children with disabilities. It is hoped that this research can assist the local authority and the playground provider to provide inclusive playground equipment that is suitable for all children especially children with disabilities. This will encourage all children to mix and socialize during playtime without any prejudice.

Keywords: *Best practice criteria; Inclusive playground equipment; Children with Disabilities*

1.0 Introduction

All children including those with disabilities have the rights to experience playing not only for leisure but also to gain benefits in terms of physical, intrapersonal, and interpersonal development. This is consistent with the 11th Sustainable Development Goals (SDGs) where all children should be given equal rights to participate and enjoy the provision of public facilities and amenities (Gan, 2020). According to Maniam (2016), playing is essential for children's development in the aspect of affective, psychomotor, cognitive, social interaction, imagination, and creativity. In supporting this need, the government has made it compulsory for all local authorities to ensure their area of jurisdiction is provided with public playgrounds with zero entrance fees to all children. One of the significant criteria to attract children to utilise these playgrounds is to gain recreation benefits.

As mentioned by Mani et al (2012) and Abd Wahab (2015), apart from safety elements, the playground should also be supported with the necessary play equipment such as slides, see-saws, spring riders, swings, monkey bars, merry-go-round, and tubes that offer the opportunities for them to develop their social skills and strengthen motor skills through climbing, swinging, jumping, sliding and running

(Kim, 2017). This equipment will trigger activities among children to play and hence will help them gain indirect benefits in terms of physical development, cognitive understanding, and socio-emotional interaction. Although the policy is spelled out to include the needs of children with disabilities, the provision of the playground, in general, is found that less attention is given to them.

These children with disabilities are faced with limited access to playgrounds because most of the play equipment is not user-friendly and does not support their physical barriers (Hansen, 2018). According to Mohd Radzi, Ismail & Ab Wahab (2020), play equipment provided at the majority of public playgrounds in Malaysia were found to be inadequate in terms of not catering to the special needs of children with disabilities and hence resulted in the absence or low participation from among those CWD. In addition, the design of the play equipment is mainly suited for normal and healthy children but not for children with physical disabilities. The design of the playground equipment should be inclusive and can be used by all children including those with disabilities to support their recreational activities.

It can be concluded that most of the designs for playground equipment in Malaysia do not meet the needs of children with disabilities. This play equipment are not provided because there are no proper and standard guidelines that can be referred to and implemented by all local authorities and playground providers in Malaysia. This issue should be given priority as it is important to develop playground equipment that is accessible, inclusive, and safe for all children including those with disabilities.

Thus, this research aims to suggest best practice criteria of inclusive playground equipment for children with disabilities to support their recreational activities. The objective of this research is to recommend the criteria of inclusive playground equipment as best practice for children with disabilities.

2.0 Literature Review

The Persons with Disabilities Act 2008 (Act 685) (PWDA) defines individuals with disabilities as persons with long-term physical, mental, intellectual, or sensory impairments in interaction with various obstacles that hindered them from fully participating in the community or public (Kaur et al., 2015; Ismail et al., 2015). Based on the Disability Discrimination Act (DDA), a disabled person is an individual who has a physical or mental impairment that has a substantial and long-term adverse effect on his ability to continue daily activities (Disabled World, 2009).

The playground as a whole can become a stage where fun activities take place. According to Karin & Paul (2014), an outdoor play area is considered as an extension of the classroom and it is crucial to establish a conducive physical and social environment in which children feel so welcome, reliable, and honoured. However, the design of a normal playground is not user-friendly or unsuitable for CWD. As stated by Hansen (2018), this is because; not all playgrounds are fully accessible and inclusive with this group of children. The inclusive playground is important for the development of children with disabilities, whereby they can learn how to interact with others, teach them to be sensitive and aware of their surroundings and develop empathy of social harmony to the society (Bendfeldt-Diaz, 2018). An inclusive playground has additional advantages for these children to develop gross-motor skills by providing accessible equipment that can be used to allow all children to enjoy the playground as it is meant to be enjoyed (May Recreation Content Team, 2016).

Foreign countries such as the United States of America (USA), Australia, and Singapore are already one step ahead because several guidelines are used as references to create and provide a fully accessible and inclusive playgrounds for children with disabilities. Several guidelines are used by these countries to create an inclusive playground, which is Accessible Play Area by the U.S Access Board (2005) and Inclusive Play Design Guide by Playworld (2015). Table 1 provides a comparison of both guidelines based on the slide, see-saws, spring rider, swings, monkey bar, tube, and surfacing floor.

Table 1. The list of proposed criteria of inclusive playground equipment

No.	Equipment	List of proposed criteria
1	Slide	<ul style="list-style-type: none"> • The ramp should be 1:16 maximum • A deck with a transfer platform and the transfer steps and transfer support at elevated routes. • The wheelchair parking • The maneuvering space for the wheelchair user • A slide that carries two people side-by-side
2	See-saws	<ul style="list-style-type: none"> • The backrest, footrest, and hand support for the seat • A longer and deeper seat for parents
3	Spring rider	<ul style="list-style-type: none"> • The backrest, footrest, and hand support for the seat • A longer and deeper seat for parents • The area at the entry point for the children to transfer, sit or gain access
4	Swing	<ul style="list-style-type: none"> • Maneuvering space • Accessible swing seat complete with backrest and safety belt • Accessible tools for the wheelchair user
5	Monkey bar	<ul style="list-style-type: none"> • The height that can be reached by wheel-chair user
6	Tube	<ul style="list-style-type: none"> • Tunnel to attempt the challenge at certain levels
7	Surfacing Floor	<ul style="list-style-type: none"> • Rubber safety unitary surfacing floor

(Adapted from: U.S Access Board (2005) & Playworld (2015))

The list of criteria adapted from the U.S Access Board (2005) & Playworld (2015) that is used by overseas playground providers can be used as reference and becomes the guideline for playground provider in Malaysia to create or build an inclusive playground that can be used for all children including those with disabilities. This is because, at present, there are no specific guidelines and criteria related to play equipment that can be implemented by local authorities and developers to propose this type of playground to the public.

3.0 Methodology

A quantitative method using questionnaire survey was distributed to 150 parents or caretakers who have children with physical disabilities and bring their children to visit and play at the neighbourhood playground in Selangor. Based on the statistics from the Social Welfare Department (2020), 16% of children with physical disabilities are from Selangor and have been recorded as having the highest total number of CWD in Malaysia.

The purposive sampling method is used by focusing on parents and caretakers who send their children with physical disabilities to the Community-based Rehabilitation Center in Selangor. This rehabilitation center is a place that provides a service for children who have disabilities to restore lost skills and regain maximum self-sufficiency. This research is narrowed down to the children who are below 12 years old and probably have a need to play on the public playground.

The Likert scale method is employed to analyze the degree of opinion from the respondents towards the particular variables. The data then is analysed with Mean Rank Analysis through Statistical Package for Social Science (SPSS) software version 22.0. The mean result for every variable is referred to the mean interval scale to indicate the different perceptions based on responses towards the playground equipment for children with physical disabilities. This mean interval scale is adapted from Jaafar et al (2018) as shown in Table 2. The outcome of this analysis is to recommend a list of criteria for inclusive playground equipment as the best practice for children with physical disabilities.

Table 2. Mean interval scale value

Mean result	Mean interval scale				
	1.00 - 1.80	1.81 - 2.60	2.61 - 3.40	3.41 - 4.20	4.20 - 5.00
Mean value	Strongly Disagree	Disagree	Slightly Disagree	Agree	Strongly Agree

(Source: Adapted from Jaafar et al (2018))

4.0 Results and Findings

Based on the latest statistics in 2020, there are 2,448 children with physical disabilities from Selangor registered with the Social Welfare Department. However, only 150 questionnaires from respondents had been received. This questionnaire survey consists of a list of criteria of inclusive playground equipment as best practice for children with physical disabilities. The result of each section is analysed and the findings are discussed to answer the objective of the research.

4.1 Result Analysis

This section covers all details about the list of criteria of inclusive playground equipment adapted from Accessible Play Area by the U.S Access Board (2005) and Inclusive Play Design Guide by Playworld (2015). Both of these guidelines are recommended to be used by the local authority and playground provider in Malaysia to suggest the best practice criteria to improve the design of existing playground equipment by providing accessibility for children with physical disabilities. This analysis approached the mean interval scale value from Table 2 to identify the agreeability status by respondents on every criterion of the inclusive playground equipment. The result for this analysis is arranged in descending order and shown in the following Table 3.

Table 3. Result for the criteria of inclusive playground equipment for children with physical disabilities

Rank	Inclusive criteria of playground equipment	Playground equipment	Mean result	Mean value
1	The spring rider should provide an accessible seat complete with a backrest and safety features.	Spring Rider	3.88	Agree
2	The swings should provide an accessible seat complete with a backrest and safety features.	Swings	3.84	Agree
3	The entrance of the current slide should provide ‘transfer platform’ and ‘transfer steps’	Slide	3.82	Agree
4	The current size of ramps for slide should be 1:12 size ramps with metal guide rails	Slide	3.80	Agree
5	The see-saw should provide an accessible seat complete with a backrest and safety belt	See-saws	3.70	Agree
6	The entrance of the current slide should provide parking space for wheelchair users	Slide	3.70	Agree
7	The surfacing floor of the playground should use rubber-type material	Surfacing floor	3.62	Agree
8	The swings should provide special features for wheelchair users to play on	Swings	3.62	Agree
9	The platform of the slide should provide sufficient space to facilitate children with disabilities to move and change directions	Slide	3.54	Agree
10	The monkey bar should provide better accessibility for wheelchair users.	Monkey bar	3.41	Agree
11	The spring rider should provide a longer and deeper seat of spring riders	Spring rider	3.34	Slightly agree
12	The see-saws should provide a longer and deeper seat	See-saws	3.30	Slightly agree
13	The swings should provide wheelchair parking space for children with disabilities	Swings	3.26	Slightly agree
14	The monkey bar should provide children with disabilities with a safety belt	Monkey bar	3.26	Slightly agree
15	The slide should provide a sliding platform that carries two people side-by-side	Slide	3.26	Slightly agree
16	The slide should provide a sliding platform that carries two people side-by-side	Tunnel	3.26	Slightly agree

There are sixteen (16) criteria of an inclusive playground that have been identified based on the guidelines from the USA, Australia, and Singapore for the respondents to choose from. In the previous table, it has shown the result that most of the criteria scored a mean between the range of 3.41 to 4.20 while the other criteria scored a mean between the range of 2.61 to 3.40. This result shows that this list is divided into two mean values which are ‘agree’ and ‘slightly agree’.

The results show that only ten (10) criteria of an inclusive playground that the respondents agreed upon and acknowledged are very practical and suitable to be applied for the children with physical disabilities. Other than that, there are six (6) criteria of inclusive playground that resulted in ‘slightly agree’ by the respondents which indicated that these criteria are recommended but not practical for children with physical disabilities.

4.2 Discussion

The list of criteria that can be applied to increase the accessibility for children with physical disabilities will be further explained. Ten (10) criteria of an inclusive playground that the respondents agreed upon showed that these criteria are highly preferred as it will create an inclusive playground for children with physical disabilities. The respondents believe that these criteria should be given priority in creating an inclusive playground for children with physical disabilities. These become useful options to encourage more children with physical disabilities to participate and play on this inclusive playground. These criteria then are being summarized into five (5) main criteria. The criteria are:

4.2.1 Accessibility to Equipment

The criteria such as installing accessible seats get the full support of the respondents. These features should be installed on spring riders, swings, and see-saws. Besides that, the swings also can be designed to have a special form that can be attached to the wheelchair. This form can allow wheelchair users to enjoy swinging activities. This form of swings consists of front and rear ramps that allow easy access onto and off of the steel platform. To ensure the safety of the users, the locks are installed at the front and the rear parts of the platforms to avoid any movement of the wheelchair during swinging.

4.2.2 Helpful Features Installed on the Play Equipment

The criteria that consist of several additional features such as transfer platform, transfer steps, and parking space for wheelchair users are suitable to be applied on the neighbourhood playground. Moreover, these features are very helpful and make it easier for children with physical disabilities to play on this equipment. The parking space is used as the space to place the wheelchair before the children crawl down to the transfer platform and the playground equipment. By providing this parking space, the wheelchair can be placed properly and prevent any accidents from happening to the children.

The criteria such as installing a seat complete with backrest and safety features also get the full support of the respondents. The respondents believe that these features act as a means of support for children with physical disabilities to support their body posture and to prevent the user from falling to the ground.

4.2.3 Prepare sufficient space for the wheelchair user

Another criterion for the slide is preparing a sufficient size of the elevated section. The elevated section is located between the entrance section to the sliding length section. This elevated section should be installed with sufficient width that can allow 2 children or the wheelchair user to go through. This criterion can be applied to improve the accessibility level of children with physical disabilities towards the existing slide.

4.2.4 Install safe material for the play equipment

As for the surfacing floor, rubber mat should be installed on the whole area of the neighbourhood playground. This surfacing floor is designed with a flat and smooth surface that will ease the children to move and play around especially for the wheelchair users. Besides that, the surfacing is made from

rubber that absorbs the impact of falls and reduces the risk of injury. The respondents realize these benefits of the surfacing floor and highly recommend it.

4.2.5 Create reachable height of play equipment

Last but not least, the design of the monkey bar should be more accessible for the wheelchair users. The respondents consider that the current design of monkey bar is unreachable for children who use the wheelchair. These children are disabled and are unable to move by themselves. It is suggested that the monkey bar should be lowered to the height that can be reached by these children. The respondents believe that by doing so, the children get the chance to play the monkey bar easily and safely too.

These criteria can be assigned as the best practice which has been concluded based on the findings of the criteria of inclusive playground equipment for children with disabilities. The practice becomes the guidelines and a benchmark to develop an inclusive playground in the neighbourhood area. This practice should be referred to by the local authority and playground provider to create playgrounds which are friendly, accessible and safe for all children including those with disabilities. This criterion should become their main agenda during the process of planning and providing facilities to society. The best practice criteria are displayed in Figure 1.

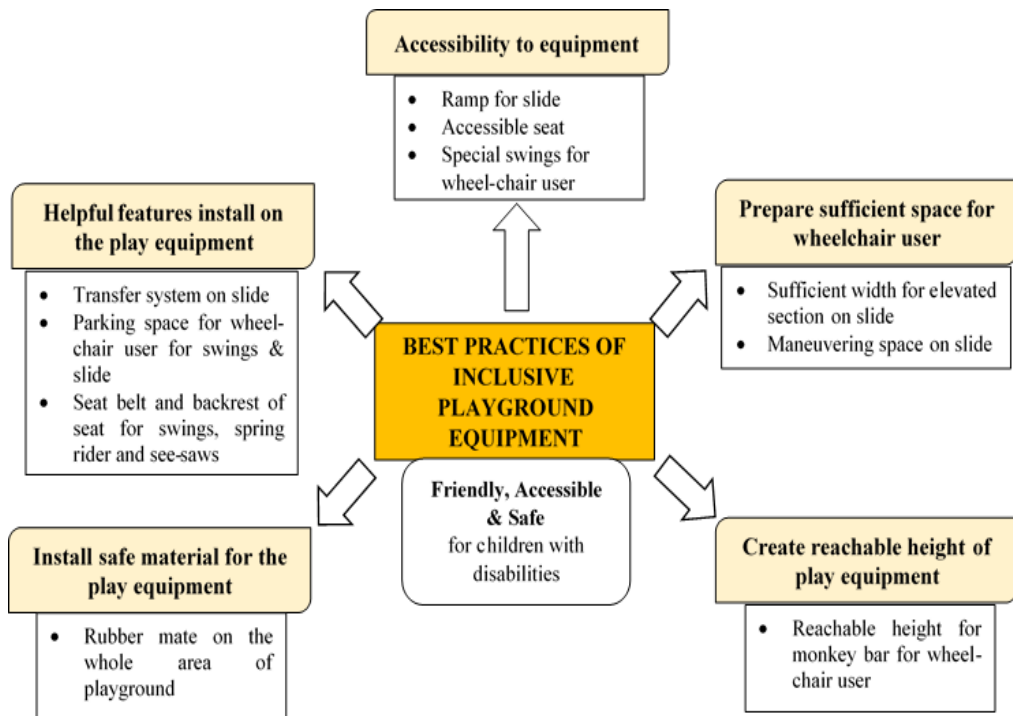


Figure 1. Best Practice Criteria of Inclusive Playground Equipment

Based on the discussion, having well-designed inclusive play spaces and parks, will allow all children including those with disabilities to develop physically, socially, and emotionally (General Recreation 2019). Once the children including those with disabilities can play with the equipment easily and safely, this means that the play equipment provides full accessibility to the children to play and get the benefits from the process of play.

Moreover, if the design of the existing equipment of the neighbourhood playground has been improved, the children with disabilities can play on the equipment and gain full access to enjoy the equipment. At the same time, they also can actively participate with other normal children to play

together in a playground. This means that the play equipment has inclusive criteria which allows all children to play together comfortably and satisfactorily.

5.0 Conclusion

In conclusion, most of the criteria of the inclusive playground can be applied to improve the accessibility and usability of play equipment for children with physical disabilities. The best practice of criteria of inclusive playground equipment becomes the main guideline for the local authority and playground provider in Malaysia to create opportunities for children with physical disabilities to access all equipment easily and safely. By including the inclusive design of these criteria, all children particularly those with disabilities can play along together with everyone else in one particular playground. These criteria can create a playground that is highly accessible and inclusive to all children to fulfil the needs of recreational activities.

References

- Abd Wahab, D. (2015). "Taman permainan uzur". *Sinarharian.com.my*. Retrieved from <http://www.sinarharian.com.my/mobile/edisi/pahang/taman-permainan-uzur-1.449953>
- Bendfeldt-Diaz, P. (2018). The benefits of inclusive playgrounds. *Growing Up Bilingual*. Retrieved from <https://growingupbilingual.com/2018/latino-parenting/the-benefits-of-inclusive-playgrounds/>
- Disabled World (2009). Definitions of Disability. *Disabledworld.com*. Retrieved from <https://www.disabled-world.com/definitions/disability-definitions.php>
- Gan, Z. (2020). Inclusion at Play: Inclusive playground becomes model for inclusion through human centered universal design. *UNICEF Malaysia*. Retrieved from <https://www.unicef.org/malaysia/stories/inclusion-play>
- General Recreation (2019). Inclusive playgrounds: how to plan, design and build inclusive playgrounds. *General Recreation, Inc*. Retrieved from <https://www.inclusiveplaygrounds.net/>
- Hansen, H. (2018). Let's play toolkit: Creating Inclusive Play Spaces For Children Of All Abilities. *Rick Hansen Foundation. Canada*.
- 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
- Jaafar, M.H., Ariffin, K., Aiyub, K., Razman, M.R., & Kamaruddin, M.A. (2018). Human element as the contributing factor towards construction accidents from the perspective of Malaysian residential construction industry. *Springer International Publishing*.
- Karin, H. & Paul, M. (2014). Quality Outdoor Play Spaces for Young Children. (1st Ed.). *Toddlers and Preschool*
- Kaur, G., Leong, T., Yusof, J. and Singh, D. (2015). Perception of People with Disability in Creating Sustainable Public Policy. *Procedia - Social and Behavioral Sciences*. 168, pp.145-155.
- Kim, H. (2017). Names of Playground Equipment. *AAA State of Play*. Retrieved from <http://www.aaastateofplay.com/names-of-playground-equipment/>
- 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
- Maniam, S. (2016). A new vision for Malaysian playgrounds. *Malaysiakini*. Retrieved from <http://www.malaysiakini.com/letters/327240>
- May Recreation Content Team (2016). What is an 'Inclusive Playground?' *May Recreation Equipment & Design, L.P. Inbound Marketing*. Retrieved from <https://info.mayrecreation.com/blog/what-is-an-inclusive-playground>
- Mohd Radzi, N.A., Ismail, K., & Ab Wahab, L. (2020). Ergonomics Concept in Inclusive Public Playground Targeting on Children with Disabilities. *Environment-Behaviour Proceedings Journal*. 5(15), 3-9.

Playworld (2015). Inclusive Play Design Guide. *Playworld Systems' Inc.*

Social Welfare Department (2020), Statistic Report of People with disabilities in Malaysia in 2020.

Ministry of Women, Family and Community Development Malaysia

U.S. Access Board (2005). Accessible play areas : A summary of accessibility guidelines for play areas.

U.S Access Board.

Surat kami : 700-KPK (PRP.UP.1/20/1)

Tarikh : 20 Januari 2023

Prof. Madya Dr. Nur Hisham Ibrahim
Rektor
Universiti Teknologi MARA
Cawangan Perak



Tuan,

**PERMOHONAN KELULUSAN MEMUAT NAIK PENERBITAN UiTM CAWANGAN PERAK
MELALUI REPOSITORI INSTITUSI UiTM (IR)**

Perkara di atas adalah dirujuk.

2. Adalah dimaklumkan bahawa pihak kami ingin memohon kelulusan tuan untuk mengimbas (*digitize*) dan memuat naik semua jenis penerbitan di bawah UiTM Cawangan Perak melalui Repositori Institusi UiTM, PTAR.

3. Tujuan permohonan ini adalah bagi membolehkan akses yang lebih meluas oleh pengguna perpustakaan terhadap semua maklumat yang terkandung di dalam penerbitan melalui laman Web PTAR UiTM Cawangan Perak.

Kelulusan daripada pihak tuan dalam perkara ini amat dihargai.

Sekian, terima kasih.

"BERKHIDMAT UNTUK NEGARA"

Saya yang menjalankan amanah,

SITI BASRIYAH SHAIK BAHARUDIN
Timbalan Ketua Pustakawan

nar

Setuju.

27.1.2023

PROF. MADYA DR. NUR HISHAM IBRAHIM
REKTOR
UNIVERSITI TEKNOLOGI MARA
CAWANGAN PERAK
KAMPUS SERI ISKANDAR