



PLANNING MALAYSIA:

Journal of the Malaysian Institute of Planners

VOLUME 22 ISSUE 1 (2024), Page 110 – 124

DESIGN GUIDELINE: EDUCATION BUILDING FOR HANDICAPPED PEOPLE TOWARDS HEALTHY ENVIRONMENT

Siti Nuratirah Che Mohd Nasir^{1*}, Nurul Nashatah Zainol Ahmad², Salmiah Aziz³, Juliza Mohamad⁴ and Noorul Huda Mohd Razali⁵

^{1&3}*Faculty of Innovative, Design and Technology,
UNIVERSITI SULTAN ZAINAL ABIDIN*

²*School of Housing, Building and Planning,
UNIVERSITI SAINS MALAYSIA*

¹*Human Centered Design Group,*

³*Habitat- Ekistics and Cultural Studies Group,*

^{4&5}*Architectural Technology and Management Group,*

*Faculty of Architecture & Ekistics,
UNIVERSITI MALAYSIA KELANTAN*

Abstract

Malaysia needs to revamp its education system to better support handicapped individuals, allowing them to lead fulfilling lives. Currently, there is a lack of educational institutions catering to their specific needs, inclusive and conducive learning environments. Many educational buildings in Malaysia fall short in providing essential accessibility features and overlook critical factors like lighting, air quality, acoustics, and ergonomics. This research aims to address this issue by developing design guidelines that focus on creating educational facilities that are accessible and promote a healthy environment, thereby enhancing their educational opportunities and overall quality of life. This study uses a mixed-method approach, including questionnaire surveys, expert interviews, and data synthesis to assess the current state of educational building design. Findings emphasize few factors like accessibility, spatial planning, acoustics, ergonomics, and inclusive design in creating education buildings that are accessible, healthy, well-designed, and conducive to social integration for handicapped individuals.

Keywords: Design, Framework, Education Building, Handicapped People, Healthy Environment

¹ Corresponding Author Email: nuratirah.mn@umk.edu.my

INTRODUCTION

The aim of the Malaysian education system is to enhance accessibility and inclusivity, particularly for children with special education needs. These children possess the same rights to formal education as their peers. As per the Special Education Regulations 2013, special education refers to an educational program that is delivered either in dedicated special schools or through integrated programs known as Program Pendidikan Khas Integrasi (PPKI) within mainstream schools. These inclusive programs cater to various educational levels, including preschools, primary, secondary, and higher secondary.

The special education program is specifically designed to address the unique needs and learning capacities of individuals with disabilities. This encompasses individuals with visual impairment, hearing impairment, speech difficulties, physical disabilities, and multiple disabilities, as well as those with learning disabilities such as autism, down syndrome, attention deficit hyperactivity disorder, and dyslexia. Pupils with special education needs necessitate additional support to overcome the challenges they face in their personal development.

Special Education

The Ministry of Education Malaysia (MOE) bears the responsibility of granting educational access to all children, including those with special education needs. In accordance with the Education Act 1996, the MOE is obligated to provide special education either through specialized schools or designated primary and secondary schools, utilizing integrated or inclusive programs. These regulations apply to government schools and government-aided schools that are offering special education programs.

Within the Malaysian education system, three distinct types of special education settings have been identified- special schools, integrated programs, and inclusive programs. Integrated programs, integrated within mainstream schools, strive to maximize social interaction between students with special education needs and their peers in regular classrooms. Identifying different categories of special needs helps schools to recognize and implement educational programs that suit the specific needs of these exceptional students. Thus, there is a Special Education Integrated Programme by MOE known as PPKI.

The MOE's Manual Operation for PPKI emphasizes careful considerations before implementing PPKI in schools. These considerations include assessing applications from parents or guardians, projecting student enrolment, determining the requirement for special education teachers, evaluating the physical infrastructure of classrooms, and ensuring the availability of necessary equipment and teaching materials (Yakob, 2022).

In addition to specialized academic materials, students with various disabilities may require physical assistance such as ramps, handrails, signage, and more. Educational facilities should prioritize creating a safe and secure environment for all students, especially those with special needs, where parents feel confident in allowing their children to be independent. It is essential for educational facilities to provide adequate resources. For instance, school spaces and environments should be safe and secure for both students and teachers, fostering a sense of calmness, motivation, activity, and confidence in movement. (Abdullah, 2018).

Children with Disabilities

The term "disabilities" originates from the concept of "disabled," which refers to issues with physical structure or function that hinder an individual's ability to carry out tasks or actions, as defined by the World Health Organization (WHO). A child with disabilities is defined as someone with various conditions such as mental retardation, hearing impairment, speech or language impairment, visual impairment, serious emotional disturbance, orthopaedic impairment, autism, traumatic brain injury, another health impairment, specific learning disability, deaf-blindness, or multiple disabilities. These children require special care, additional attention, special education, and related services. However, there are several general types of disabilities: blindness, deafness, physical disabilities, mental health disabilities, and intellectual or learning disabilities. Under the Persons with Disabilities Act 2008 (Act 685) (PWDA), individuals with long-term physical, mental, intellectual, or sensory disabilities that prevent them from fully participating in community or public life are considered persons with disabilities (WHO, 2023).

This paper aims to achieve two main goals: first, to emphasize the identification of design aspects in educational buildings catering to handicapped students, and second, to put forth a fundamental guideline for creating well-designed educational facilities that are specifically tailored to the needs of handicapped people. The findings of this paper will shed light on the significance of architectural design aspects for handicapped people emphasizing how these features can contribute to efficient spatial circulation and accessibility, thereby ensuring a conducive educational environment. Additionally, it will underscore the importance of preventing discrimination against this group in terms of education, while aligning with the broader objective of enhancing the overall quality of life through educational advancements. The results of this research will serve as a valuable guide for incorporating design elements that facilitate the creation of well-designed educational buildings.

LITERATURE REVIEW

Definition and Importance of Education Building for Handicapped People

Education building for handicapped people refers to specialized facilities that are designed to provide inclusive and accessible educational environments for individuals with disabilities. These buildings are specifically tailored to meet the unique needs of students with physical, sensory, cognitive, or developmental disabilities, ensuring equal opportunities for learning and participation. These buildings provide an environment that accommodates the specific requirements of students with disabilities, enabling them to fully engage in educational activities, interact with peers, and access necessary resources and support services. By addressing physical barriers and implementing assistive technologies, the education buildings for handicapped people aim to create an inclusive educational experience that fosters the intellectual, social, and emotional development of students with disabilities. They contribute to creating a more inclusive society by fostering understanding, acceptance, and empathy among all students (Ab Wahab, 2022). In summary, education buildings for handicapped people provide specialized facilities that accommodate the needs of students with disabilities, ensuring equal access to education and promoting inclusivity, diversity, and equal opportunities for all individuals.

Implementation of Education Building for Handicapped People in Malaysia

Individuals with disabilities face challenges in their interactions due to physical impairments, limitations in activities, and contextual factors. Consequently, their restricted mobility and reliance on others necessitate suitable housing and living arrangements, where well-designed housing facilities can contribute to their rehabilitation. Universal design principles are applied to housing, incorporating features, products, and procedures that benefit all users. By adhering to universal design principles, housing designs become accessible and advantageous to a wider range of individuals (Shamri, 2022).

Design Concepts

To design a space that caters to the needs of disabled people, the following characteristics of barrier-free adaptable housing can be considered to make it preferable:

Table 1: Design Space for Handicapped People.

Element	Description
Ensuring Accessibility	provide effortless access to buildings, housing units, and services for individuals with mobility, hearing, or vision limitations.
Providing Sufficient Space:	Adequate space should be included in housing units and public areas to accommodate wheelchair users.

Element	Description
Enhancing Safety	Safety should be the top priority in the design for individuals' daily activities
Addressing Emergency Preparedness	incorporate features that enhance safety during emergencies, enabling effective navigation and evacuation for individuals with disabilities.
Ensuring Ease of Use and Maintenance	enhance accessibility and ease of use for disabled individuals in using and maintaining the building, dwelling units, and equipment.

Source: Ab Rahman, 2018

Challenges in designing Education building for Handicapped People

Designing education buildings to accommodate handicapped individuals presents a distinct set of obstacles that must be overcome to ensure inclusivity and accessibility. Several key challenges arise in this context as per Table 2 below. Addressing these challenges in the design of education buildings for handicapped individuals promotes inclusivity, facilitates equal access to education, and fosters an environment where individuals with disabilities can thrive and fully participate in the educational experience (Shamri, 2022; Abdullah, 2018; Muhiddin, 2023).

Table 2: Challenges in Designing Education Building.

Key point	Description
Ensuring Physical Accessibility	Main challenge is to make the building easily accessible for people with disabilities. This means adding ramps, elevators, wider corridors, and doorways for wheelchair users. The layout should be designed to reduce obstacles and barriers that could make it difficult to move around.
Addressing Sensory Considerations	Education buildings need to accommodate people with sensory impairments like visual or hearing impairments. Ex: braille signage, auditory aids, visual aids, and proper lighting to improve visibility and communication.
Prioritizing Ergonomics and Comfort	The comfort of students with disabilities should be prioritized through ergonomic design principles. Ex: adjustable furniture, specialized seating options, and optimizing acoustics to create a conducive learning environment for individuals with hearing or cognitive impairments.
Integrating Assistive Technologies	Include assistive technologies to help students with disabilities learn effectively. Ex: accessible computer labs, assistive devices, and software applications that support communication, learning, and access to information
Creating Inclusive Learning Spaces	To make inclusive learning spaces that accommodate various learning styles and preferences Ex: flexible classroom arrangements, adaptable furniture, and interactive learning tools that cater to different abilities and disabilities.

Key point	Description
Ensuring Safety and Emergency Preparedness	Prioritize safety and emergency preparedness for individuals with disabilities. Ex: accessible evacuation routes, emergency alarms, and clear communication systems that consider the needs of all occupants.
Applying Universal Design Principles	Accessible and usable for people with different abilities. This means considering equitable use, flexibility, simplicity, clear information, error tolerance, low physical effort, and appropriate dimensions throughout the design process.

Source: Muhiddin, 2023

Disabled Community in Malaysia

Individuals with disabilities, commonly referred to as People with Disabilities (PWD), represent a vulnerable segment of the Malaysian population (Esfanfard, 2018). According to the Department of Social Welfare, Ministry of Women, Family and Community Development, Malaysia has seven (7) categories of disabled persons that can be considered for registration of disabled persons by the Department of Social Welfare, they are as follows: Hearing Disability, Visually Disability, Speech Disability, Physical Disability, Learning Disabilities, Mental Disability, and Multiple Disabilities. Figure 1 shows the number of registered PWDs in Malaysia according to states. As shown, Selangor had the highest registered number of PWDs with 100,835 while Johor had 72, 368 registered PWDs (Ab Rahman, 2018).

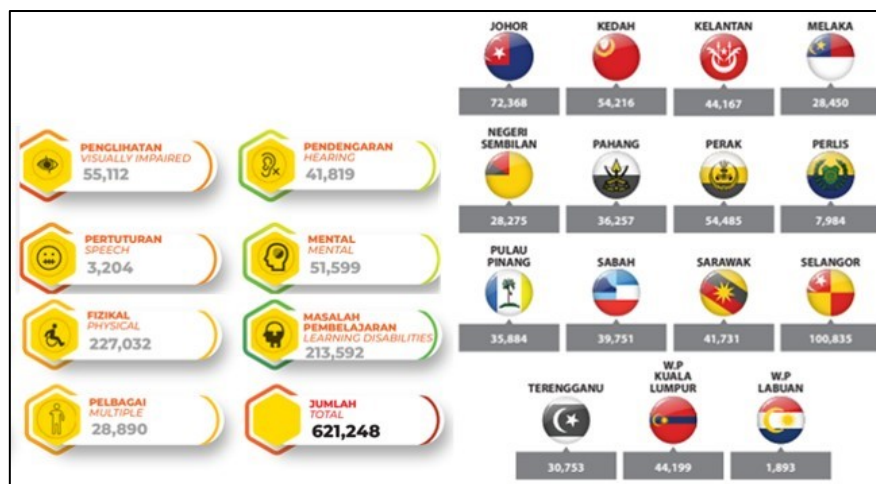


Figure 1: Registration of Persons with Disabilities, 2021

Source: Statistics Report 2021, Department of Social welfare, Ministry of Women, Family and Community Development, Malaysia.

Universal Design

Universal design refers to the concept of creating interior spaces that are accessible and usable by people of all abilities, including individuals with disabilities. It involves designing environments, products, and services in a way that eliminates barriers and promotes inclusivity. Universal design aims to accommodate a wide range of users, considering factors such as mobility, sensory, and cognitive impairments. The goal is to provide equal access and enhance the overall user experience for everyone, irrespective of their physical or cognitive abilities (Esfandfard, 2022; Steinfeld, 2012).

Table 3: Seven Principle for Universal Design.

Principle	Description
Equitable Use	Design possesses practicality and marketability for individuals with a wide range of abilities
Flexibility in use	Design caters to a broad spectrum of individual preferences and abilities.
Simple and intuitive use	Easily comprehensible, irrespective of the user's experience, knowledge, language skills, and level of concentration.
Perceptible information	Effectively communicates essential information to the user, regardless of ambient conditions or the user's sensory abilities.
Tolerance for error	Minimize hazards and mitigate the potential adverse consequences of accidents or unintended actions.
Low physical Effort	Enables efficient and comfortable use with minimal fatigue.
Size and space	Suitable for approach and reach, regardless of the user's body size, posture, and mobility.

Source: Centre of Excellence in Universal Design, National Disability Authority, 2020

The seven principles as per Table 3 above aim to provide guidance for designing environments, products, and communications. They can be utilized to assess existing designs, inform the design process, and educate designers and consumers on the qualities of more user-friendly products and environments (Nasir, 2021).

The idea of Universal Design originated with a focus on individuals with disabilities, but its application extends to providing assistance and support for various groups, such as the elderly, pregnant women, children, and those with temporary illnesses or injuries. As a result, the advantages of incorporating Universal Design are extensive. Table 4 below explains the category of design requirements in universal design.

Table 4: Category of Design Requirements in Universal Design.

Requirement	Component
Sensory	Tactile warning, guide ways and information
Outdoor environment	Obstruction, signage, street furniture, pathways, kern, ramps, pedestrian crossing, alarms
Horizontal areas	Door, entrance and lobbies, corridor, handrails and railings, bridges
Vertical areas	Ramps, lift and stairs

Source: Esfandfard, 2018

Universal design in any building should incorporate features such as ramps, accessible toilets, adequate space, accessible entrances, handrails, and practical overall design, as exemplified in Table 5.

Table 5. Design Feature of Universal Design

Design features	Description
Entrance	Stepless entrance, sloping walks at 1:20 max, light doorbell at reachable height, clear space inside and outside the door
Circulation	Easy access, accessible space for wheelchair user,
Bathroom /toilets	Provide clear space, curb less shower, handrails, handle, fauxet in single lever handles
Kitchen / Pantry	Space between Face of cabinets and walls, clear floor space, clear knee space under the table and sink, adjustable height wall cabinet,
Switches and control	Reachable height, accessible for wheelchair user and children, hands free switch, remote control,
Windows	Can view from the seat, reachable to open, close and lock,
Door	Clear opening, accessible, open loop handles,
Floor	Non-slip floor surface, easy to move,
Stair	Provide handrails
Ramp curb	Slope of 1:2 max, easy for mobility impairment and stroller.

Source: Esfandfard, 2018

RESEARCH METHODOLOGY

This research employs a mixed methods approach, recognized for its ability to provide a comprehensive understanding of research issues. The combination of quantitative and qualitative methods involves the administration of questionnaires and semi-structured interviews, ensuring direct data collection without interference. The study focuses on establishing a foundational framework for designing educational facilities tailored to the needs of individuals with disabilities. To achieve this, two strategies are implemented. The first involves distributing 30 sets of questionnaires to handicapped students, gathering demographic data and basic assessments to derive research criteria and objectives. The second stage consists of interviews with teachers, educators, and

three building construction experts (architects and interior designers), serving as a representative sample to gain insights into the research criteria and objectives. Semi-structured questions, tailored to the study's objectives, are presented to these experts, chosen based on their criteria of relevant experience, specialization, innovative thinking, and availability. The inclusion of quantitative data aids in obtaining early findings using Statistical Package for the Social Science (SPSS) regarding respondents' perceptions of education building, implementation levels, and participant involvement. Meanwhile, qualitative data are using computer assisted ATLAS.ti to capture content analysis on current situation of design and performance levels in developing educational buildings for handicapped individuals.

ANALYSIS AND DISCUSSION

This section presents the data analysis procedures that are followed in conducting the questionnaire, including respondents' selection, interview design, data collection, and analysis. It also discusses the educational building identification that is considered throughout the research process.

Questionnaire

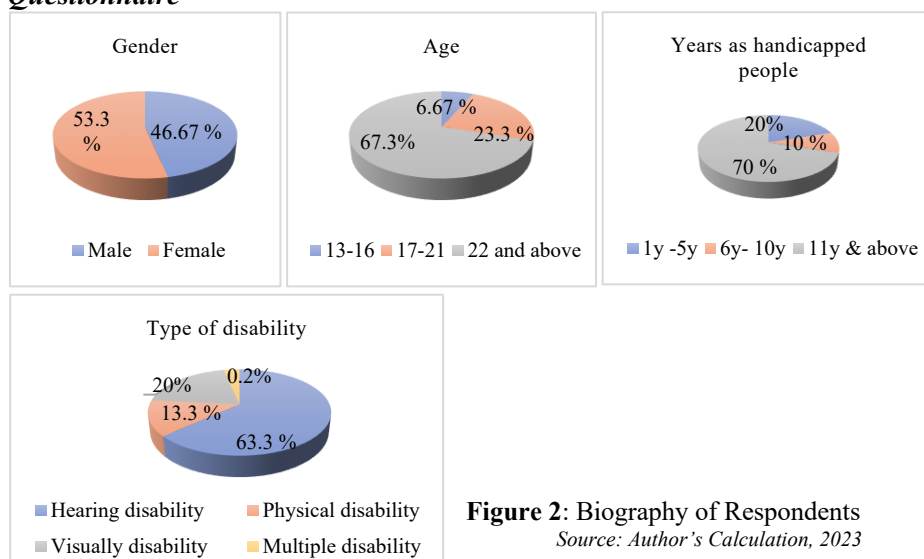


Figure 2: Biography of Respondents
 Source: Author's Calculation, 2023

This study comprised a total of 30 participants aged 13 and above who took part in the survey. The survey itself was administered and distributed online through social media platforms such as Facebook and WhatsApp. Based on the feedback received from the respondents, all 30 participants who completed the survey form were individuals with various types of disabilities.

Table 6: Handicapped Student Assessment

Type of educational institution previously	No of students	percentage
Public school	19	63.3%
School for hearing impaired	9 students	30%
Private School	2 students	6.67%
Home school	-	-

	Yes	No
1. Does your school/institution/college/university have students with handicapped person pursuing higher education?	28 (93.33%)	2 (6.67%)
2. Are you aware of the provision made for the students with disabilities in ‘People with Disabilities Act, 1995’	13 (43.33%)	17 (56.67%)
3. Does your school/institution/college/university provide special infra-structural facilities for the handicapped student according to your needs?	19 (63.3%)	11 (36.67%)

Source: Author’s Calculation, 2023

The findings that are presented in Table 6 indicate that most of the respondents, specifically 93.33%, attend schools that cater to higher education for students with disabilities. In contrast, 6.67% of the respondents do not attend such schools. Additionally, only 43.33% of the students are familiar with the provisions that have been outlined in the ‘People with Disabilities Act, 1995’, while a significant portion, i.e., 56.67% remains unaware of it. Moreover, 63.3% of the students have reported that their school offers specialized infrastructural facilities for individuals in these categories, whereas 36.6% have mentioned the absence of such provisions at their school.

Table 7: Educational Building Identification

Identification of design aspects in educational buildings catering to handicapped students	Yes	No
1. Designated quiet areas or soundproof rooms	23 (76.67%)	7 (23.3%)
2. Captioning systems or sign language interpreters / clear signage and visual communication	13 (43.33%)	17 (56.67%)
3. Designated seating areas	11 (36.6%)	19 (63.3%)
4. Assistive technology: captioning devices or hearing aids	6 (20%)	24 (80%)
5. Visual alert systems to notify hearing-impaired students of emergency situations	15 (50%)	15 (50%)

Educational facilities specifically tailored to the needs of handicapped students	Yes	No
1. Classrooms equipped with appropriate acoustic treatments. Example: sound-absorbing materials, to minimize background noise	9 (30%)	21 (70%)
2. Accessible communication methods established, such as sign language interpreters	12 (40%)	18 (60%)
3. Training and awareness programs provided to teachers and staff members on how to effectively communicate	7 (23.3%)	23 (76.6%)
4. Color-coded pathways / tactile, visual alarms, to aid in navigation and communication	8 (26.67%)	22 (73.3%)
5. Accessible restrooms and common areas	27 (90%)	3 (10%)
6. Ongoing evaluations and assessments conducted to ensure the educational facilities remain in compliance with accessibility standards	10 (33.3%)	20 (66.67%)

Source: Author's Calculation, 2023

Based on Table 7, the data shows variations in the implementation of design aspects in educational buildings catering to handicapped students. Certain features such as designated quiet areas, captioning systems, and designated seating areas are more common; there is a need for more information on assistive technology and visual alert systems. Although there is progress in classrooms with acoustic treatments and accessible restrooms, improvements are required for accessible communication, training programs, and color-coded pathways. Ongoing evaluations are crucial for maintaining accessibility standards. These findings emphasize the importance of meeting the specific needs of handicapped students and further enhancing inclusive environments.

Interview

The interview sessions were conducted with educators and experts in the field of architecture, accessibility, and inclusive design. These interviews provide insights and expertise to inform the development of the design guidelines.

Table 8 Interview with Educators and Experts in Designing an Educational Building for Handicapped People

Participant, state	Most critical accessibility requirements	Specific regulations or guidelines that designers should follow	Specific considerations when designing classrooms	Key factors to consider of mobility, navigation, and wayfinding within the facility	Common areas: cafeterias, restrooms, and recreational spaces, made more inclusive and accessible
Madam Linda (Special Education Teacher), Terengganu	Accessible signage, adjustable-height workstations, and non-slip flooring.	Uncertainty	Accessible entrances, wide doorways, and sufficient space	Accessible entrances, ramps, and elevators	Provide flexible seating
Miss Ain Izzati (Hearing Impaired Teacher), Pahang	Ensuring that the building has ramps, elevators, and wide doorways	Uncertainty	Layout to minimize obstacles and provide clear pathways.	Use color contrast on walls, floors, and doors to aid individuals with visual impairments	Maintain clear and wide pathways
Architect, Johor Bahru	Wheelchair accessibility: ensuring that the building has ramps, elevators, and wide doorway, assistive listening systems, visual alarms, and clear acoustics	Universal design and accessibility in the built environment - code of practice, person with disabilities act (act 685) • Uniform Building By-Law (UBBL), 2014 universal design and accessibility in the built environment - code of practice (second revision)	Acoustic environment that minimizes background noise, technology resources, such as computers, tablets, and interactive whiteboards, are accessible to students with disabilities, supporting their learning needs	Avoid clutter, uneven surfaces, or unnecessary barriers that could impede mobility, install handrails, and grab bars in hallways, staircases	Create an environment with sensory sensitivities, integrate assistive technologies
Interior designer A, Kuala Lumpur	Implementing features like tactile signage, braille labels, and contrasting colors	Time-Saver Standards for Interior Design and Space Planning Book by Joseph De Chiara, et al.	Sound-absorbing materials, acoustic treatments, and consider the placement of speakers or microphones for effective communication. Adequate space between furniture for manoeuvrability	Implement clear and visible signage with legible fonts, contrasting colours, and appropriate pictograms	Design accessible restrooms with spacious layouts, grab bars, and accessible fixtures, inclusive equipment cater to a diverse range of abilities.

Participant, state	Most critical accessibility requirements	Specific regulations or guidelines that designers should follow	Specific considerations when designing classrooms	Key factors to consider of mobility, navigation, and wayfinding within the facility	Common areas: cafeterias, restrooms, and recreational spaces, made more inclusive and accessible
Interior designer B, Selangor	Designing ergonomic furniture, appropriate lighting, and clear pathways	Time-Saver Standards for Interior Design and Space Planning Book by Joseph De Chiara, et al, research papers, Application of Universal Design in the Built Environment by International Islamic University Malaysia (IIUM)	Accessible exits, evacuation chairs, apply universal design principles, such as flexibility, simplicity, and intuitive use	Ensure adequate lighting throughout the building, paying attention to areas with potential glare or shadows, minimize excessive noise and provide acoustic	Non-slip flooring, appropriate lighting, and clear emergency evacuation routes

Source: Author's Interview, 2023

From Table 8, the educators and experts shared their insights on critical accessibility requirements, regulations, and considerations when designing educational buildings for individuals with disabilities. Experts understand that the advantages of designing an educational building for handicapped people promote inclusivity, providing equal access to education for all students. Furthermore, it improves mobility and independence for individuals with disabilities, allowing them to navigate the facility with ease. The design fosters a sense of belonging and social integration among students.

The findings, meticulously organized and refined, underscore the critical importance of developing design guidelines for educational facilities catering to individuals with disabilities. This research not only emphasizes accessibility but also underscores the pivotal role of a healthy environment in fostering enhanced educational opportunities and an overall improved quality of life for handicapped individuals. This refined organization ensures that the findings seamlessly align with the primary goals of the research, facilitating more comprehensive understanding and application of study's outcome in the context of creating inclusive and supportive educational spaces.

CONCLUSION

The educational building for individuals with disabilities is to address the needs of disabled individuals who require design improvement and modifications to improve accessibility. These modifications enable them to maintain their

independence and continue to perform activities at the centre. However, depending on the manufacturer and contractor who is involved, building adjustments can vary in size, shape, and cost. Building or design space and modifications should align with the specific needs of the occupants or user. The significance of accessibility, circulation, spatial planning, acoustics, ergonomics, and inclusive design in creating education buildings is to promote a healthy and inclusive environment for handicapped individuals.

In summary, the design guidelines for educational facilities serving the disabled aim to provide a supportive atmosphere that considers their individual needs. It includes amenities like captioning systems, reserved seating places, quiet zones, and accessible bathrooms. Notably, there is potential for improvement in areas like visual alert systems, accessible communication techniques, assistive technology, and extensive training programs. Therefore, the key findings emphasize the importance of creating environments that enhance educational opportunities and overall quality of life for individuals with disabilities. The focus is on actionable insights to improve the accessibility and health aspects of educational buildings, contributing to a more inclusive and supportive learning environment for handicapped individuals.

ETHICAL STATEMENT

Ethical approval for this study was given by Faculty of Architecture & Ekistics, Universiti Malaysia Kelantan, and Faculty of Innovative, Design and Technology, Universiti Sultan Zainal Abidin.

REFERENCES

- Abdullah, M. F., & A. A. (2018). Factors Influencing parents in selecting school for children with special education need . *Journal of the Malaysian Institute of Planners*, 207-216.
- Ab Rahman, S. A., & N. S. (2018). Housing for Disabled People: What Do They Need? *Journal of the Malaysian Institute of Planners*, 266-274.
- Esfandfar, E., & M. H. Elnaz (2018). Universal Design in Urban Public Spaces for People with Disability: Case Study of Tehran, Iran. *Journal of The Malaysian Institute of Planners*, 173-182.
- Ministry of Women, Family and Community Development. (2021). *Statistics Report 2021, Department of Social Welfare* . Malaysia: OMR Press Sdn Bhd.
- Mohd Muhiddin, A. A., & H. M. (2023). Green Campus Implementation in The Malaysian Public Universities: Challenges And Solutions. *Journal of the Malaysian Institute of Planners*, 274-298.
- Nasir, C. M., & D. W. (2022). Housing as an Integral Development for Health categories that deliver a healthy housing in Malaysia. *International Journal of Accounting, Finance and Business*, 391
- Nasir, M. N. (2016). Special Education for Children with Disabilities in Malaysia: Progress and Obstacles. *Malaysian Journal of Society and Space*, 78-87.
- Shamri, S.L., E. M. (2022). Strategies in Improving the Building Efficiency and Daylighting: A Case Study of Green Building. *Journal of the Malaysian Institute of Planners*, 99-109.

Siti Nuratirah Che Mohd Nasir, Nurul Nashatah Zainol Ahmad, Salmiah Aziz, Juliza Mohamad and Noorul Huda Mohd Razali
Design Guideline: Education Building for Handicapped People Towards Healthy Environment

- Steinfeld, E., & Maisel, J. L. (2012). *Universal Design: Creating Inclusive Environments*. John Wiley & Sons.
- Wahab, L., & K. I. (2022). Accessibility And Inclusivity of Playgrounds for Children with Disabilities in Malaysia. *Journal of the Malaysian Institute of Planners*, 172-183.
- Yakob, H. S. A. (2022). Qualitative Assessment of Usability and Accessibility of Housing Design Elements for Disable People. *Journal of Malaysian Institute of Planners*, 374-388.

Received: 30th Nov 2023. Accepted: 23rd Jan 2024