UniSZA as the National Centre of Design for Disability in Malaysia

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Abstract. This paper explains the initial steps of establishing the national centre of design for disabled people in Malaysia. As we all know, there is still no evidence of the existence of a creative centre for industrial product design in the country, especially for this special group. Through the initiative from the School of Industrial Design located in Universiti Sultan Zainal Abidin (UniSZA), we take a commitment to channel societal significances through designing, developing and producing innovative product design for various categories of disabilities in this country, such as physically disability, mentally disability, vision impair, learning disability, speech disability and others. It will be done entirely in a centre known as National Centre of Design for Disability (CDD), which highlights the standards and quality of design, where the outcomes meet the satisfaction of the end users through its function, ergonomics, safety, comfort and aesthetics for them to not ashamed to join their routine activities in the open public environment. The CDD improves to enhance the existing equipment alongside providing advice and assistance for the state-of-the-art research outcomes.

Keywords: National Centre of Design for Disability; Tetraphochomelia Child; Special Products and Equipment; School of Industrial Design

1. Introduction
The Activities involving social services to disabled people in our country have been around since the 20th century. The establishment of Social Welfare Department in 1946 was an initial step towards helping disabled people for the business continued until 1960s. Since 1950s, several NGOs have been established like Malaysia Association of Blind in 1951, Spastic Centre in 1960, National Society for the Deaf in 1961, Cheshire Home in 1964, and Bethany Home for Epileptic Children in 1966 [1].

The addressing of the Malaysian government regarding well-being for disabled people was reviewed in some strategies and programs to ensure that Malaysian disabled people enjoy their lives more comfortably. For instance, the raising of caring Malaysian societies has outlined in Malaysia’s 2020 vision [5] as a stepping stone for disabled people to get along with the local community without shame or embarrassment [6]. In addition, the Malaysian government has set up a panel of advisors for this special group on their needs, reviewing equipment in their programs through joint venture between the government and private sectors, identifying any specific related issues, and suggesting long last plans for activities in their daily lives [7].

2. The Existing Scenery
A random survey conducted in 1958 has shown that disabled people in Malaysia represent 1% of the total population. Also, the Infosoc Malaysia 2002 e-forum reports stated that disabled people in Malaysia represent 0.42% of the total population [2]. However, the real numbers of people with disabilities in Malaysia is quite difficult to obtain due to statistical constraints [8]. This is due to the customary problems in the country, where parents are embarrassed to register their disabled children [9].
In 1995, the Social Welfare Department specified that there were 56,000 of disabled people in Malaysia have successfully registered thus after a year, the department took the initiative to collaborate with the local telecommunications companies to encourage more disabled people in their registrations [2]. As a result, there were 445,006 of disabled people in Malaysia have had registered in 2012 [3].

The Malaysian government has taken initiatives to protect the rights of people with disabilities through ratifying the Convention on the Rights of Persons with Disabilities (CRPD) in 2010. The Government has also adopted the Persons with Disabilities Act 2008 as well as has provided social protection services in the fields of health, rehabilitation, and education for children with disabilities guided by National Policy for Persons with Disabilities and also National Plan of Action for Persons with Disabilities [3].

Based on Table 1 below, since 2014 the Social Welfare Department stated that there were 531,962 of registered disabled people in Malaysia have been divided into Malay (324,668), Chinese (106,523), Indian (55,453), Peninsular Natives (2,289), Sabah Natives (25,872), Sarawak Natives (12,153), and others (5,004). On the other hand, Table 2 showed a breakdown of statistics for learning disabilities (188,911), physically handicapped (174,795), hearing disabilities (62,153), vision impair (50,827), mental (24,263), speech (3,988), and others (27,025). By breaking down the percentage of statistics, the data can be referred to in Figure 1. Also, the statistical breakdown of people with disabilities in Malaysia through the breakdown of each state can be found in Table 3.

Table 1 : Disabled People Registration by Ethnic Groups in 2014 (Source: [4])

| Ethnic Group                  | Total |
|-------------------------------|-------|
| Malay                         | 531,962 |
| Chinese                       | 106,523 |
| Indian                        | 55,453  |
| Peninsular Natives            | 2,289   |
| Sabah Natives                 | 25,872  |
| Sarawak Natives               | 12,153  |
| Others                        | 5,004   |
| **Jumlah Total**              | **531,962** |

Table 2 : Disabled People Registration by Disability Categories in 2014 (Source: [4])

| Disability Category               | Total |
|-----------------------------------|-------|
| Hearing                           | 80,022 |
| Disability (including speech)     | 22,153 |
| Physically                        | 174,795 |
| Mental                            | 24,263 |
| Mental and Physical               | 24,263 |
| **Jumlah Total**                  | **531,962** |

Table 3 : Disabled People Registration by Malaysians’ States in 2014 (Source: [4])

| State                      | Total |
|----------------------------|-------|
| Selangor                   | 28,000 |
| Kuala Lumpur              | 44,192 |
| Penang                     | 25,977 |
| Kedah                      | 19,934 |
| Perak                      | 11,502 |
| Melaka                    | 19,109 |
| Johor                     | 21,894 |
| Pahang                    | 30,143 |
| Sabah                     | 27,001 |
| Sarawak                   | 22,645 |
| **Jumlah Total**           | **285,123** |

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3. Understanding Disability
In 2016, UNICEF Malaysia has conducted a study on disabilities that engaged 756 participants from Selangor, Kelantan, Sabah, and Sarawak covered a few approaches like surveys, discussions, workshops, and interviews. The findings of the study were used to advise the stakeholders to develop programs and systems that were more inclusive to this special group. Six out of 10 participants (58.4%) were under-informed or ill-informed about disability; 87% said they wanted to know more. Only 20% of the participants saw behavioural and mental conditions as disabilities. Most regarded children with learning disabilities, hyperactivity, or aggression as being badly behaved. Those with mental disabilities were labelled as crazy or stupid and were often made fun of. The finding was also saying that to light the lack of knowledge and misconceptions about disability and has resulted in stigma against people with disabilities and limited their access to their rights to be a part of society. Therefore, the stakeholders must not just taking a note of the data, but to create an environment that allows and encourages children with disabilities to be part of active society. Based on Figure 2 show that people were more accepting and understanding of people with physical disabilities, the conditions which were tangible to them such as loss of vision, inability to walk, total loss of hearing, or loss of limbs. About 80% of the participants recognised these physical limitations as disabilities [3].

4. The Strategies to Establish and Implement the National Centre of Design for Disability (CDD)
There are ten plans to establish and implement the national centre of design for disability under the management and administration of School of Industrial Design, UniSZA – (i) philosophy behind the establishment, (ii) design for disability, (iii) a pilot of special project, (iv) special interest group, (v) design vs. non-design experts; (vi) the rationales of formation; (vii) the values of universal design; (viii) the objectives of establishment; (ix) the facilities for implementation; and (x) the funding.
4.1 Philosophy behind the Establishment
The national centre of design for disability (CDD) @ UniSZA takes an initiative to contribute its expert for disabled people in Malaysia comprises various categories of disabilities, such as physically disabilities, mentally disabilities, vision impair, learning disabilities, speech disabilities, and multiple disabilities. It highlights the standards and quality of design, where the outcomes meet the satisfaction of the end users through its function, ergonomics, safety, comfort and aesthetics. So that end users are not ashamed to join their routine activities in the open public environment. As well, it also improves to enhance the existing equipment alongside providing advice and assistance for the state-of-the-art research outcomes. The CDD @ UniSZA strongly believes that disabled people are a part of the community and they should not be isolated or alienated. It is a tough duty to ensure a better life for them in the future. The CDD @ UniSZA realizes to design, develop, produce, and commercialise special products and equipment for disabled people that should be managed in systematic way.

4.2 Design for Disability: Reality or Illusion?
The CDD @ UniSZA has conducted several research projects on disabilities, particularly from category of physically disabilities. There are also scholars and students completed their projects and theses on these particular subjects. However currently, there is nothing to be commercialised due to the absence of a platform like a centre of excellence. The CDD @ UniSZA also thinks about the survival of research findings contained in theses that are quite disappointing due to the many valuable contributions that are only stored in the bookshelves.

4.3 A Pilot of Special Project with Tetraphocomelia Child
In realizing the goal, the CDD @ UniSZA come up with a strategic plan by having a special design project with a Tetraphocomelia child named Nordamia binti Daeng, a 12 years old girl. The Tetraphocomelia is a very rare case found in the world, which are only 20 cases registered patients globally. As the CDD @ UniSZA was directly involved in this new product development, the focus was in designing and manufactures a wheelchair that was specially designed for her, including producing a practical design that would cater to the needs of the Tetraphocomelia user, this project was carried out for nearly two years, beginning in 2016 and ending in 2017.

4.4 Special Interest Group (SIG)
In ensuring the smooth formation of a platform as a centre of excellence, the setting up a special interest group, or known as SIG is considered necessary. The SIG will gather as many experts from various related fields (outside the university) to work together professionally covering aspects of design, development, research, academic, intellectual property, licensing and transfer of knowledge, manufacturing, commercialization, marketing, logistics, and management.

4.5 Design vs. Non-Design Experts
Other than that, the CDD @ UniSZA will strengthen all teaching force from three sub-fields: Product Design, Transport Design and Furniture Design. The experts with PhD and Master degrees (local and foreign universities) with sufficient professional experience in academic and industry sectors – locally, nationally and internationally. The experts are also categorised as practicing industrial designer with actively engaged in research, consultancy, publications, and development of many industrial products and equipment for local and international markets, including producing new design management strategies to involve in the other related works of public interest. On the other hand, the CDD @ UniSZA is also welcoming collaboration of experts from non-design fields: Engineering, Social Sciences, Business and Management, Health Sciences, and Medicine.

4.6 The Rationales of Formation
There are five rationales of formation for CDD @ UniSZA, namely (i) to assess and focus on the needs of disabled people from design research process to commercialisation stages, (ii) to meet
market demand for new or enhanced special products and equipment, (iii) to become a hub for disabilities data and reference in Malaysia and Asia Pacific region; (iv) to act as an intermediate to play the important role between the governmental agencies, NGOs, industries, charitable organizations, institutions of higher learning and other bodies as well as the public who are willing to work together in helping the disabled, and (v) to provide advice and consultation in locating or enhancing any special products and equipment in Malaysia and ASEAN region.

4.7 The Values of Universal Design
The CDD @ UniSZA will complete all seven values of universal design as follows: (i) to equitable the use of outcomes that must be useful and marketable to any group of disabled people to avoid segregation or stigmatisation condition, (ii) to flexible the use of outcomes that must accommodate a wide range of individual preferences and abilities, (iii) to simple and intuitive the use of outcomes that must be easy and understandable to use regardless of the user’s experience, knowledge, skills, or concentration levels, (iv) to perceivable the information of outcomes that must communicate necessary information effectively to the user regardless of ambient conditions or user’s sensory abilities; (v) to tolerance the error of outcomes that must minimise the hazards and adverse consequences of accidental or unintended actions, (vi) to low physical the effort of outcomes that must be usable efficiently and comfortably with minimum fatigue or vibration, and (vii) to size and space the approach and use of outcomes that must appropriate in size and space for user’s approach, reach, manipulation, and use that regardless of the user’s body size, posture, or mobility.

4.8 The Objectives of Establishment
In order to establish and implement CDD @ UniSZA, there are four objectives that need to be taken into account, which are (i) to design and manufacture special products and equipment for people with disabilities based on the values of universal design; (ii) to conduct and encourage the enhancement of design and manufacture special products and equipment for the current and the future generation of disabled people; (iii) to improve the standards and quality of special products and equipment by providing satisfaction to all targeted disabled users; and (iv) to increase public awareness of the role of design to meet the needs of people with disabilities.

4.9 The Facilities for Implementation
The facilities available in the CDD @ UniSZA are ranked amongst the best in Malaysia. Those include industrial design studios, model making workshops, and computer labs with 3D printing machines. The accessible software of design is such as CAID, AutoCAD, Rhinoceros, and Solid Works that used for design conceptual and surfacing. Meanwhile, a detailing designing is up to product analysis software such as NX and Master Cam which enable the lab to be a one stop design and development centre. Furthermore, the other extensively software from Desktop Publishing are such as Adobe Illustrator, Adobe Photoshop, Adobe Dreamweaver, and Macromedia Director would be very helpful in creating the front end product design presentation, either in output of hardcopy presentation panel or for the animation needs. The industrial design workshop is completed with all wood-working tools, whereas for the metal and plastic sections; the workspace is fully-equipped with a range of hand tools and machineries for forming, fabricating and assembling, from lightly to heavily jobs.

4.10 The Funding
One of the most important things in the establishment and implementation of CDD @ UniSZA is the need for funds. The contributions are indeed through the governmental channels, private sectors, NGOs, and also from public funds. The funds will be fully managed by UniSZA Malaysia.

5. Conclusion
It is the hope of everyone in School of Industrial Design, Universiti Sultan Zainal Abidin Malaysia that to enable this national centre of design for disability to be established in the near future. With the implementation of the CDD @ UniSZA will progress a step further in being a leader in a field that has not been tapped by anyone locally or globally. The setting up of CDD @ UniSZA if surveyed in terms of marketing has a wide and unique potential. The special products and equipment that are designed and developed will not only be marketed in the country, but will also encourage demand from the overseas market, which has to be catered for. Therefore, the establishment and implementation of CDD @ UniSZA will fulfil the needs of 159,547 of physically disabled people identified in 2017 in Malaysia and will also be in demand globally – through a wide range of the outcomes that includes (i) daily and routine needs like beds, chairs, bath, and toilet equipment; (ii) mobile equipment like wheelchairs and scooters; (iii) posture and carriage items like trolleys and stroke support systems; (iv) paediatric equipment like postural aids; and (v) small items like specially-designed toothbrushes, paintbrushes, stationaries, and cutleries.
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