

A Study on Environmental Development to Improve Occupational Performances of the Disabled: A Case Study of Major Retail and Wholesale Companies in Bangkok

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Abstract: This research aims to alleviate problems of environments and facilities of people with disabilities in retail and wholesale companies within the area of Bangkok, Thailand by applying the concept of universal design to enhance their environments. The objectives of this research are to study environments and facilities of people with disabilities to design and efficiently improve occupational performances of them in companies. This research used a mixed-method approach (qualitative-quantitative research). The research instruments of the study are interviews, questionnaires and observations. The data are analyzed to help figure out the solution to improve those two aspects for people with disabilities. The needs of people with physical disabilities in workplace are mostly stair climbing, passage ways and the need of suitable desks. They prefer metal, wood and leather material with interest in square shape. The need to improve electronic device switches is also expressed. Regarding office equipment, the improvement of storages, retrieving of items from high places and easier usages of staples, pencils, pens and paper punches could be highly appreciated. The findings are used in developing and designing furniture to efficiently improve occupational performances and correspond to the true needs of people with disabilities.

Key words: People with physical disabilities, environment and facilities for the disabled, universal design, office furniture, workplace, work efficiency, retail and wholesale companies

INTRODUCTION

As a developing country with more than 60 millions in population, Thailand is hardly supporting the lives of 1.2 million people with disabilities (2% of total population) in its country. The absence of executable policy to help people with disabilities in their daily lives, education and occupation should be urgently corrected.

This research aims to alleviate the problem by examining the employment and working lives of people with disabilities. Researchers consider that by improving the financial stability of the disabled other problems would be subsequently solved or improved as well. However, the majority of the disabled are freelancers or self-employed with low or almost none in terms of financial stability, high risk, complication in management and no apparent social benefits (Kowitthienchai, 2014; Lu and Chen, 2017; Smith, 2002). To improve such aspect, this research will focus on enhancing occupational performances within the environment of retail and

wholesale companies in Bangkok. The reasons are high revenue of the companies and high amount of people with disabilities. According to persons with Disabilities Empowerment Act, Section 33, B.E. 2550 "For the purpose of promotion and development of life quality of disabled persons, employers and owners of business and public agencies shall employ disabled persons to work in positions suitable to them in proper proportions of the entire number of their workforce". As a result, the amount of employed people with disabilities in Bangkok would be 1.255 which proved to be a suitable case of study (DEPD, 2016).

From 3 types of disability that can be employed according to the act (visual, auditory and physical disabilities), the most common disability is people with physical disabilities. Correspondingly, the study will focus on this group of people. "If we can do as much as regular people, they would just hire regular people for a job. The disabled must work harder and endure more to get that job", this saying indicates that people with

disabilities could hardly get a job, not because of their disabilities but because of the title of 'disabled' (Preiser and Ostroff, 2001; Kowitthienchai, 2014; Sriboonyapornrat, 2016).

Previous studies revealed that there are 3 obstacles for the disabled to work effectively. Society and culture, regular people perceived people with disabilities as burdens and hindrances in working and consequently, affect their employments and payment. Education, knowledge and experience. The lack of support in education, knowledge and experience limited the available jobs and positions, environment and facilities. The difficulties in daily lives such as transportation could be eased by the understanding of employers in their needs. These 3 obstacles should be adjusted or changed to elevate Thailand and perception of its people and to establish equality within the country (Lin and Wu, 2015). Researchers expect that this research will contribute in solving the current problems and providing new insights for companies to improve the lives of the disabled. Thus environment and facilities will be highlighted to reveal the problems and to be correctly adjusted to improve occupational performances of the disabled in companies with basis of universal design (Creswell, 2007; Creswell *et al.*, 2010; Lin and Wu, 2015).

Research objectives: To study environment and facilities of people with disabilities to improve occupational performances of retail and wholesale companies within the area of Bangkok. To apply the idea of universal design to improve environment and facilities of people with disabilities to optimize the occupational performances of retail and wholesale companies within the area of Bangkok.

MATERIALS AND METHODS

Research instruments: This research employed interviews, questionnaires and observations. Each tool was qualified by 6 experts from 3 different fields; statisticians, disabilities studies experts and universal design experts, using the index of Item Objective Congruence measure (IOC).

Participants and data collection: With the population of 1,255,75 participants were initially recruited by volunteering and classified into 3 categories: people with visual disabilities, people with auditory disabilities and people with physical disabilities. The data were collected from 25 people with physical disabilities from 3 companies; C.P. All Co. Ltd., Big C Supercenter Co. Ltd. and Ek-Chai Distribution System Co. Ltd. The result

indicated that people with physical disabilities needed shuttle bus service, ramps, restrooms, elevators, stair climbing equipment, improvement of passageway and equipment to help reach higher shelves and places, bumping-proof equipment at the edges or corners and flooring materials that can indicate and prevent slipping (Johnson *et al.*, 2007; Tashakkori and Teddlie, 1998).

Data analysis: The researcher used brainstorming technique to summarize and analyze the data to come up with the design. About 10 experts in disabilities studies, the employers of disabilities and universal design experts were asked to participate in the brainstorming (Saito, 2006). The design is responding to the needs of people with disabilities with virtual 3D design, sizes and materials to be a model to produce or develop products.

RESULTS

The data were gathered from 25 subjects with disabilities by using interviews, questionnaires and observations in relation with the idea of a study on environmental development to improve occupational performances of the people with disabilities in workplace (Table 1).

People with disabilities believe that improving environment and facilities will improve their performance (Gray *et al.*, 2012). They also expressed their need in improving desks, file cabinets and office equipment in the following aspects: strength, cost, adjustable height desks, with space to store items and more convenient, item falling prevention ledge and sharp corners of the desks which can be dangerous. The data is gathered and analyzed to help designing and developing desks and file cabinets that suit people with disabilities.

The main procedures for product design and development

- Step 1: planning mood board and outlining ideas. The design is focusing on accessibility and convenient of people with disabilities as indicated by the collected data. The design is simple, enhancing the understanding in using and solving problems regarding of functions of furniture. The design, colors and style are in natural style with the revision from 7 universal design theories of Ronald L. Mace
- Step 2: using 2 analysis tools to help in development

W1H:

- What designing desks and file cabinets for people with disabilities?

Table 1: The second description to improve occupational performance

Information	Description
Gender	15 males; 10 females
Age	26-41 years old
Background of resident	Central and Northeast of Thailand
Education	5 Junior High School; 17 Senior High School
	3 Bachelor Degree
Disabilities	25 physically disabled
Cause of disabilities	5 since birth; 20 from accidents
Workplace	14 in offices; 11 in warehouses
Difficulties in workplace	15 by environmental effects; 8 by facilities
	2 by colleagues and friends
Environmental difficulties	Stair climbing difficulty 15 Passage ways within buildings 4; furniture usages 3; buying foods 3; restroom signs and difficulty 2
Job accidents	23 with no recorded accident; 2 with experience in electrocution and items falling
Need in improvement of workplace environment and facilities	Agree 20; neutral 5
Favorite material	Metal 10; wood 5; leather 5; plastic 3; cement 2 there are concerns in using glass and any brittle materials that can pose some risks
Favorite shape	Rectangle 14; square 7; circle 3; others 1
The most concurring problematic furniture	Desk 10
	Cabinets 5; chairs 4; no problem encountered 6
The most concurring problematic electronic devices	Switches and sockets 13; photocopy; machines 4; fans and air conditioners 3; fax and scanner machines 3; no problem 2
The most concurring problematic office equipment	Staplers 7; pens and pencils 4; cutters and paper; punches 3

- Who for people with disabilities and normal people to be able to use the desks?
- When working?
- Where offices of companies in Thailand?
- Why to make this equal for people with disabilities and normal people to use the desks efficiently?
- How to show that it is possible that the desks and file cabinets can be used without any inequality between normal people and people with disabilities and can be a model for further improvement in the future?

SWOT strengths: People with disabilities can use desks and file cabinets without any discrimination and can share more than one common application of the furniture while being able to adjust the usage properly. This can also be the model for developing office furniture for people with disabilities.

Weaknesses: As a prototype model, the various usages may pose some difficulties and complications.

Opportunities: Even though there are various kinds of desks and file cabinets, none of them was designed to correspond with the needs of people with disabilities. As such the desks and file cabinets specifically for the disabled could be a preferred option and gain marketing value.

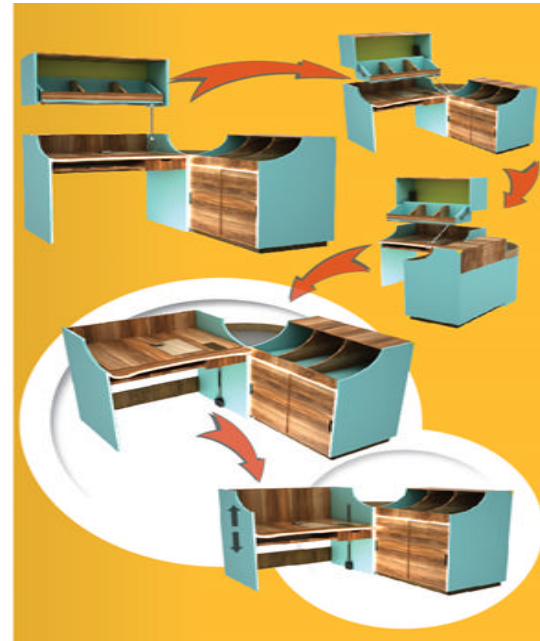


Fig. 1: Desks and file cabinets for the disabled

Threats: The desks and file cabinets, specifically designed for the disabled, are complicated in construction to correspond to the needs of the target group (Regnier, 2003). Some parts are hard to find or make without proper sources or tools.

Desks: Hydraulic is installed for adjusting the height of the desks for convenient accessibility of the disabled. Barrier is elected to prevent accidents in item retrieving situation. The edges of the desks are designed in round appearances with bumping-proof rubber to facilitate people with disabilities in using wheelchairs. The wheels are installed to facilitate in moving the desks from places to places and can be locked to the desired location as in Fig. 1.

File cabinets: The upper storage space is designed to help the disabled avoid themselves in bending down and also provide extra utility in storing items. The bumping proof rubber and sliding doors are installed with indent handles. The wheels are also installed to help the disabled in the need of moving.

Hanging cabinets: This is designed to mount on wall with spacious inventory and easy accessibility with a cord to pull it down. The cord is made of rubber and can be moved left and right as in Fig. 2.



Fig. 2: Wall mount hanging cabinet with a cord



Fig. 3: Office equipment storage and utilities

Office equipment: There are 2 problematic office equipment for disabled. Paper punches and staplers. They are designed as a board to conveniently hold a paper in place. The staplers and paper punches are also designed to be pressed with arm or elbow to help easing the difficulties of the disabled as in Fig. 3. Cutter, pens and pencils are designed as a glove for less burden in writing as in Fig. 4 and 5.

There is space to store office equipment for the disabled with switch to turn the connected appliances on or off. This can alleviate the times of plugging in the devices and accidents that may have happened.

The top of the desks can be opened to drop items into a lower drawer as in Fig. 4. This is to eliminate the



Fig. 4: Labor-saving stapler and paper punches

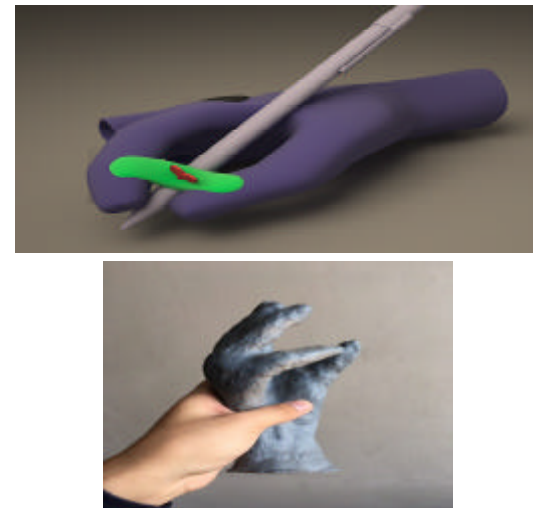


Fig. 5: A design of gloves to help in holding pens and other equipment

need of grabbing the handle and pulling the drawer to access the storage which could be highly problematic for the disabled (Fig. 3-6).

Step 4: Choosing the materials and planning production process. Filling table top wooden frames with paper cores to reduce the manufacturing cost. This also contributes in tenacity and higher encumbrance of the furniture. The light weight of material also improves hydraulic efficiency in adjusting the height. Laminate is also applied to waterproof the furniture with bumping-proof rubber around the edge as in Fig. 7.

Choosing wood with high hardness value as wooden frames. Providing handles, drawer tracks, hanging cabinet tracks, hydraulic choke, switches and wheels for examples.



Fig. 6: Desks, file cabinets and hanging cabinets being in use

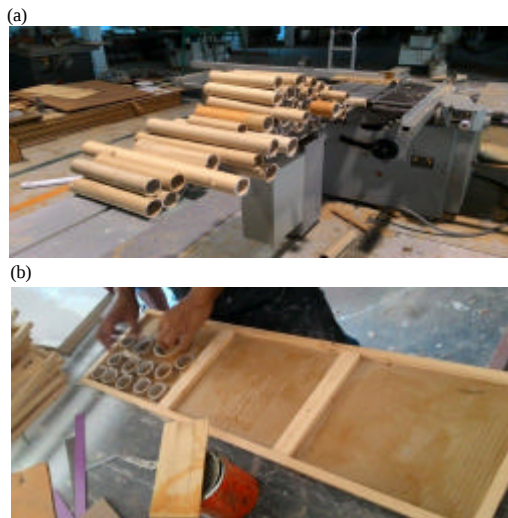


Fig. 7: Paper-core-filled table top wooden frames

DISCUSSION

The design is concluded with the idea of cultivation, convenience, utility, durability, attractiveness and safety by opinions of the experts. The pros and cons are listed below:

- The design is new, unique and attractive
- The idea of using paper could be expanded into various ideas
- The design should be less complicated with higher durability in usage
- Higher strength material is preferred but with a concern of the weight and mobility of the product
- Build-in drawers are recommended
- Using paper core as a substitute material is economically advantageous
- More utilities is preferable
- Packaging for shipping may be needed
- The safety must be highly ensured due to the nature of the disabled

- Various kinds of material such as real wood, clothes, rubber, sponge or others could be considered as a part of material to improve safeness and reduce the weight of the product
- The life-span and durability must be concerned when using paper as material so that the disabled can entrust in the quality of the products and to make it durable, suitable and economical as is designed

CONCLUSION

This qualitative research is focusing on designing and developing the desks, file cabinets and office equipment by using the data gathered from 25 subjects with disabilities working in companies such as Big C and Tesco Lotus within Bangkok area by using interviews, questionnaires and observations. The products will improve the efficiency of people with disabilities in working which could be delivered throughout Thailand by the companies. As a result, the life of people with disabilities in workplace will improve greatly and becoming more secure with higher occupational performances.

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