

How universal design could be a solution for independent living?

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Case study: student accommodation in the UK universities

Abstract:

Keywords: disabled student; living space; barriers; independent living; universal design.

This project studies one disabled people's 'Seven Needs' to independent living, the housing issue, in relation to disabled student in British Universities. Firstly, the student's living activities, the barriers in the student accommodation in different cities in the United Kingdom have been identified. Secondly, the goal to live independently to their disability related needs is examined. A group of students encounter barriers that some of the student accommodation is applied not only for disabled student but also the ordinary student. Bathroom is one of the areas that visually express medical language in the living space. The project highlights the universal design as a solution that offers a design that can be suitably used for disabled people and still be attractive and functional for ordinary people.

Introduction:

Some people will feel hesitate to use the bathroom with many handles, but some people will tend to use the automatic door instead of the manual door even though they are able-bodied people. Probably, only less people realize that the handles and the automatic door are tremendously useful and helpful for the people with special needs.

The able-bodied people have the tendency to use whatever they feel it is easier but they do not want something looked 'special'. Along the same line, the disabled also does not want to be treated 'special'. Special can be a bad word.

Design that looks 'not special' and useful for able-bodied and disabled people would be a solution and this concept goes with Universal design concept. However, universal design cannot be completely applied for everyone; therefore this project will only focus on the design that can be suitable for both independent wheelchair users and ordinary people. This project aims to remove the 'special' look, which appears in most of the design for disability and also can be universally applied and used by both disabled and ordinary people.

Legislations such as Disabled Student Allowance (1993), Disability Discrimination Act (1995), and Equality Act (2010) have existed in the United Kingdom (UK) to guarantee the right of disabled people to achieve higher education. These legislations ensure that most of the facilities in the UK universities are accessible for disabled people and consequently, the enrollment of disabled student have increased over the years. Accordingly to the Higher Education Statistic Agency (HESA), there are 78,910 disabled students amongst 879,105 first year UK students enrolled in higher education in 2011/2012 (Higher Education Statistic Agency, 2013). Specifically, 2901 of the disabled students have physical impairment or mobility issues. Significant amount of studies have physical impairment or mobility issues. Significant amount of studies have been done on how accessible are the facilities in the university or learning environment for the disabled students. A report found that they are 'penalized' and their access to some facilities in the university are limited (BBC, 2009), yet little is known about the specific experiences of disabled students in their living space at the universities.

"To most people, going to bed or getting up from a chair may seem the easier thing in the world, but there are many ageing, disabled, or otherwise frail people for whom these actions are painful or impossible." (Vanderberg, 2008).

It has been shown that when a student accommodation is made available for both disabled and able-bodied students, it tends to disadvantage the disabled students and inhibit them from living independently. Universal design (Erlandson, 2008) is the design of a service, product, or environment that can be used by as many people as possible regarding their age, ability, gender and language. The author proposes the application of universal design concept as a solution for independent living. It will result in living spaces that can be used by both disabled and able-bodied students. Moreover, the medical ambience

commonly found in rooms designed specifically for disabled people will be eliminated and thus the rooms will remain attractive for everyone.

This project will focus on 'housing', which has been identified as one of the disabled people's 'Seven Needs' (Hasler, 2003). The experiences of wheel chairs users while navigating through their living space at university provided accommodations and the common barriers that they encounter will be discussed. Due to the time limitation, this study will solely focus on the bathroom area of the living space. From a technical viewpoint, bathroom has been cited as a challenging area to design for disabled people (Raschko, 1991).

This study presents three case studies performed at three different university-provided accommodations located in Leeds, Hull and Newcastle. Observation and interview were chosen as the methods to achieve a better understanding on the experiences of wheel chair users and the problems they encounter.

The aim of this research is to discover a design concept, which could enable the disabled student to live more independently in their student accommodation. Moreover, it purposes to identify and evaluate disabled student's experience of living in student accommodation. Specifically, it aims to identify and evaluate ways, in which activity, room and movement in the case student accommodation take account of disabled student's needs.

Furthermore, there are three main objectives underpinning this project, the first of which to find the problems the disabled students face while living in the student accommodation. The second objective is focusing on the activities that the disabled students face barriers at the student accommodation. The final objective is to achieve the design that can be suitable yet functional for both ordinary student and disabled student which in this case are the wheelchair users.

In order to gain the data, firstly, the author will investigate how the student accommodation is currently designed to account for the needs of disabled students. Secondly, the experiences of wheel chair users while living in the student accommodation will be evaluated. Finally, the author will discover a design concept that helps the disabled students to live more independently in their accommodation and remains suitable and functional for both the disabled and ordinary students.

However, the limitation of this project was that the limited time to meet the participants because of the participant is in the other cities with their busy activities.

Literature Review:

Design and disability

For this project, design will be used as a verb, which is a process. According to Miller (1996), design is the thought process embracing the creation of a creature.

The definition of disability based on World Health Organization's new international classification of function and disability is characterized as the outcome or result of a complex relationship between an individual's health condition and personal factors, and of the external factors that represents the circumstances in which the individual lives.

"Design and disability can inspire each other." (Pullin, 2009).

Independent living

Independence (Goldsmith, 1976), for disabled people have a sensitive attraction, disabled person has to prove that he can race on the same terms as his able-bodied generations. Independent could enhance the confidence, proud, relief, self-determining, give power, able to take opportunities, aware of the differences between the possible and the improbable, anticipant of a positive future, compared with dependent which is anxiety, excluded from ordinary life, uncertainty, helpless and unwillingness to plan, resistant to change and fearful of the future. (Clarkson, et al., 2003).

As it relates to housing, independent living can be described as a situation which assist the disability to be able to live independently (outside an institutional) background in their daily living with the support of the architectural and interior fixtures (Raschko, 1991). People with disability have likely more difficulties in improving the dwelling access compared with the other population who are able to select their situation that permit independence and ease of living (Hemingway, 2011).

Wheelchair User

'Wheel chair users' are people with impaired mobility who different with ambulant, disabled person needs a wheelchair with the purpose of get about. Meanwhile, 'wheelchair bound' defines a slighter amount of people who are entirely reliant on their wheelchairs and helpless without it. Whereas, the 'independence users' are the people who capable of controlling their manual or powered wheelchair by themselves and need no assistance. (Vandenburg, 2008, p. 952).

Housing for disabled

Throughout the last 100 years, governments in the UK have identified minimum standards concerning to the physical design of housings. The intention is not to create fully usable or livable spaces through the dwelling that would allow disabled people to live in dwellings with improved comfort and potential for independence. For many disabled people, a regular problem, specifically those reliant on the use of wheelchair, is obtaining physical access to housing that

allows them to use all rooms and accommodations without the demand for help. (Imrie, 2006).

Moreover, according to Hasler (2003), housing is one of disabled people's 'Seven Needs' to independent living. For disabled people, independent living demands a physical living situation that does not disable them further (Barnes, 1991; Gasser 1992). Nevertheless, because of the rejection from the political, social and economic organization of typical society, most physical spaces, including public amenities and buildings, have been created without taking disabled people's access needs on board. For example, housing is often an area in which disabled people are forced to confront and overcome the barriers and institutional discrimination (Hemmingway, 2004).

Universal design

The definition of universal design according to Heiss et al. (2010) is environments, products, services and programs, which can be used by every people to the maximum possible range without the demand for any alteration or special design. Moreover, Caplan (2005) stated that universal design classifies the concept that something designed well for disabled people as well as with learning disabilities will probably be initiate attractive to the abled-body people. Universal design has altered the lives of people who need extraordinary designs with the purpose of function.

According to the Centre for Universal Design, NC State University (1997), the Principles of Universal Design (Herwig, 2008, pp. 170) are equitable to use' flexibility in use; simple and intuitive in use; perceptible information; tolerance of error; low physical effort; and size and space for approach and use.

Design Thinking

Design Thinking (Curedale, 2012, pp. 3-4) can be defined as an approach or methodology that could assist the doer to be more constantly innovative on designing. It concentrations on the persons and the methods which encompassed are the ones that permit empathy with persons. It is a combination of the creative thinking and analytical thinking methods. Moreover, it could be useful for the one that have problem which is poorly defined, less information, flexible situations, and environment that expect the doers to have an innovative solutions. Whereas, Ambrose and Harris (2010) stated that the definition of design thinking is current in every period of the process from the brief to complete work and numerous solutions can be created for any brief and the solutions can be widely different based on the practically, creativity and budget.

Research method

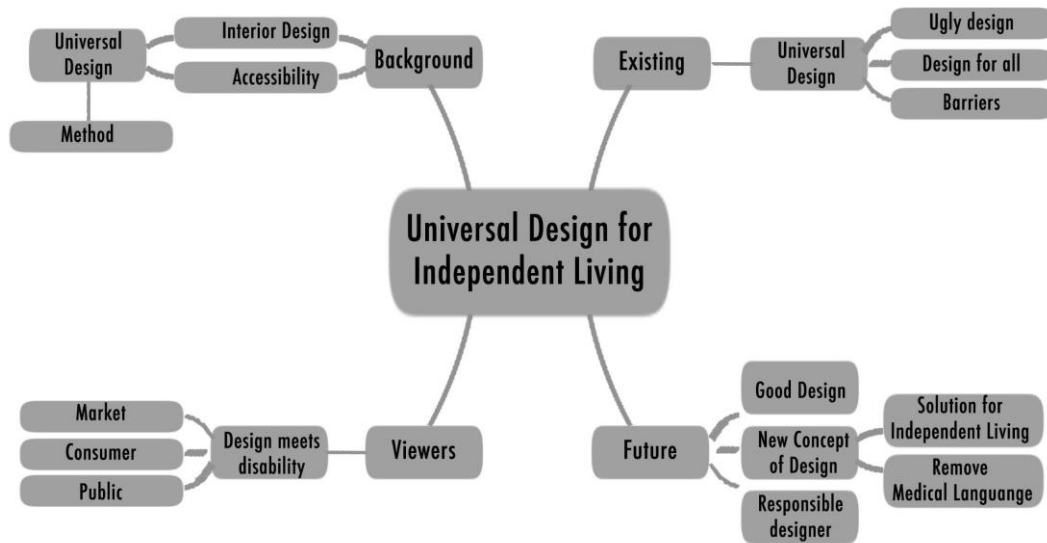


Figure 1: Research mind map (Suteja, 2013)

Research method in this project is very significant; it creates new information and deeper consideration of this topic. Qualitative research was conducted in this project due to gain clearer understanding and data. Different methods were applied as being creative and innovative as a designer.

The primary research constructed in this project is case study with three different student accommodations in the United Kingdom. Moreover, observations, direct interviews with three wheelchair students, Disability Support Manager as well as interview via E-mail with Housing Manager has been conducted in this project to achieve a better understanding and knowledge in terms of accessibility in the student accommodation.

Firstly, Semi-structured observations were chosen to develop more detailed information from the data from each accommodation. Photographs, sketches and notes were prepared as additional information for the data.

Secondly, three interviews with the student who are using wheelchair have been conducted in this research to achieve more understanding and knowledge of the experience and barriers of the student using the wheelchair while staying in the student accommodation. The unstructured story telling interviews with a guiding set of topics were prepared to address the session in order to make participants feel more comfortable. Even though it could be costly, but the data gained from the interview probably could not be achieved from other methods such as questionnaires.

Next, two of the wheelchair students were observed, shadowing the activities of the wheelchair student in the student accommodation. They are asked about their experiences on the student accommodation, and photographed during their

activities. It is revealing patterns to inform a study of relationship between their behaviors and the barriers in doing daily activities in their living spaces.

Finally, the interview with the Student Support Manager and the house manager were done to understand about the regulation and the accessibility provided by the university for disabled student as well as to achieve the information about the available type of rooms at the student accommodation for disabled student and its accessibility.

Findings

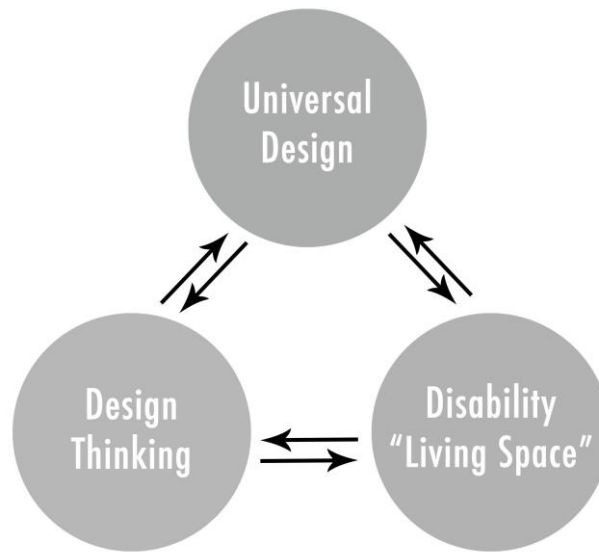


Figure 2: Venn Diagram (Suteja, 2013)

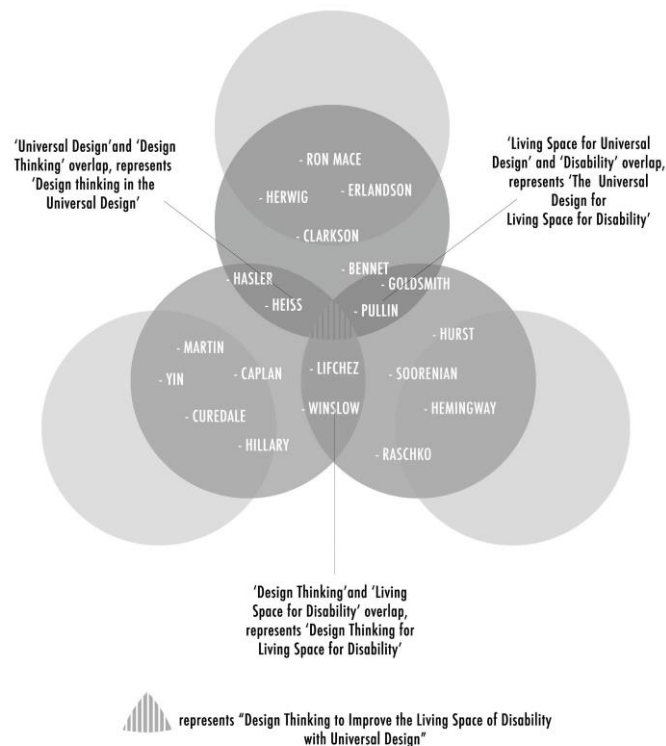


Figure 3: Venn Diagram (Suteja, 2014)

Venn diagram in figure 1 and 2 shows the relation between universal design, design thinking and the living space for disabled people in this project. The diagram helps to develop better understanding on how to connect the main topics and discover the importance of the topics related each other.

Accessible student accommodations

Three participants lived in student accommodation provided by the university. All rooms are accessible and adaptable for the wheelchair users. Student-1 stayed in private house with standard room and sharing kitchen and bathroom in Hull. Student-2 stayed at an en-suite room with sharing kitchen and bathroom in Newcastle. Student-3 lived at the en-suite room with sharing kitchen with another 11 students in Leeds.

The accessible room for disabled student will also be available for ordinary student only if there is no disabled student at the moment. Even though most of the student accommodations are accessible for the disabled student, but there are problem faced by the disabled people, for example the kitchen and bathroom where the users usually face problems. In the kitchen, the sink and stove are too high and there is no space for the toe of the wheelchair users. Whereas, in the bathroom there are handles, which are not really safety for the wheelchair users while, they are transferring from the wheelchair to the shower chair and the closet.

Bathroom

Bathroom will be the focus area since it is differentiating the ordinary and disabled student student's room due to the existed fixtures for example handles and shower seat.

"Bathroom can be a very challenging area to design for disabled and elderly from a technical viewpoint. A designer will feel stunned when primary challenged with rules and restrictions operating to the bathroom." (Raschko, 1991, pp. 216).

Table below will describe the differences of the bathroom in student accommodation in Newcastle, Hull and Leeds.

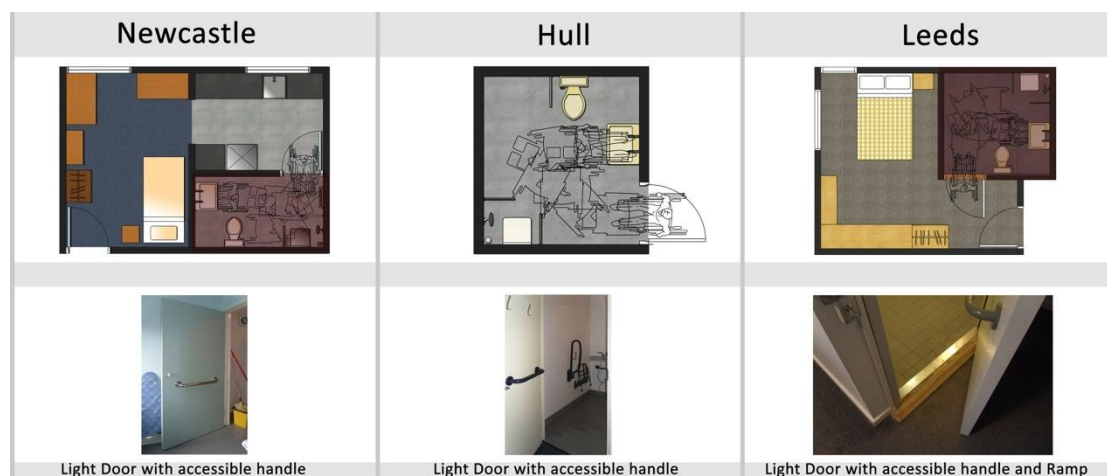


Figure 4: Survey Comparison (Suteja, 2013)

Medical Look at the Bathroom for disability



Figure 5: Typical bathroom for disabled people (Suteja and Novitasari, 2013)

The typical bathroom for disabled people in three-student accommodation shows medical look, which expresses dissimilarities with the ordinary bathroom. This would probably creates a hesitate feeling for the users. Moreover, the handles are not easy to use. Some are quite heavy and difficult to move.

Universal Design as a solution

The tendency of renting the accommodation for both disabled student and ordinary student by the student accommodation allows the room to be suitable for both. Hence, the concept of the universal design will be appropriate for this purpose since the definition of the universal design is the design for all users regarding the abilities as well as being attractive design for the able-bodied people.

Design Project

The goal of this project is creating a design for both independent wheelchair user and ordinary people, making the wheelchair user to be more independent as well as functional for the ordinary people. The concept should be related with the principles of universal design. The other important aspect is removing the medical look, which typically appears in the design for disability.

- Idea Generation

The inspiration for this project was the multifunction furniture; it offers more than one function in one product. Moreover, multifunction furniture also offers flexibility in limited space; it would help to save space.

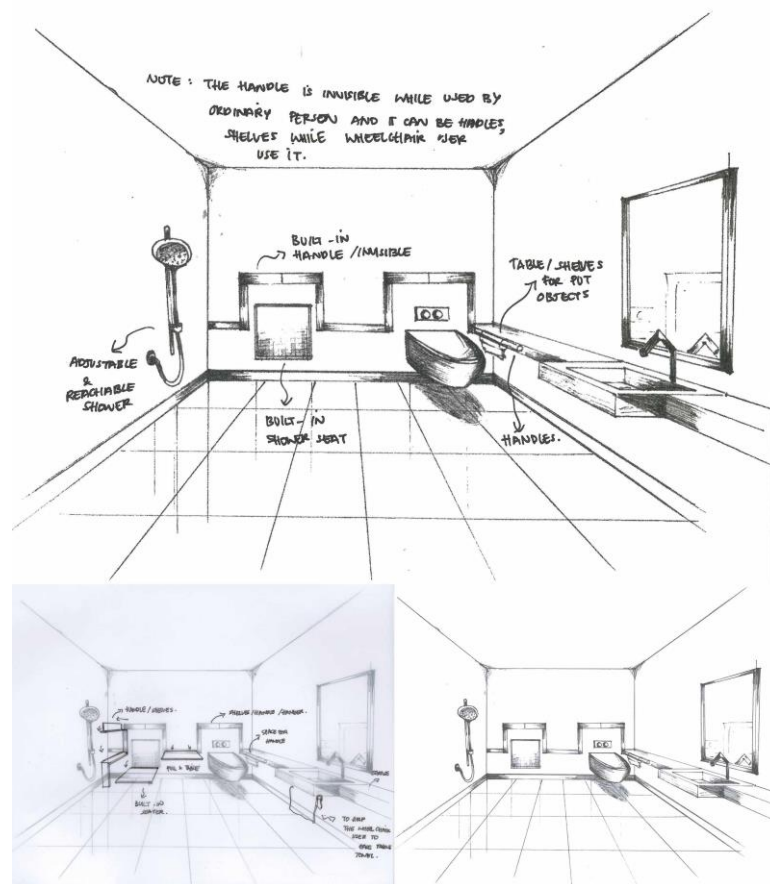


Figure 6: Sketches for Idea Generation (Suteja, 2013)

- **Mind Map**

The main idea is the universal design and how it relates with the disability and living space. The universal design also connects with inclusive design and design for all since the terms have some similar definition. Moreover, the principles of the universal design are important to be the parameter of the future design. Furthermore, the disabled is narrowed down to the physically disabled, the independent wheelchair user.

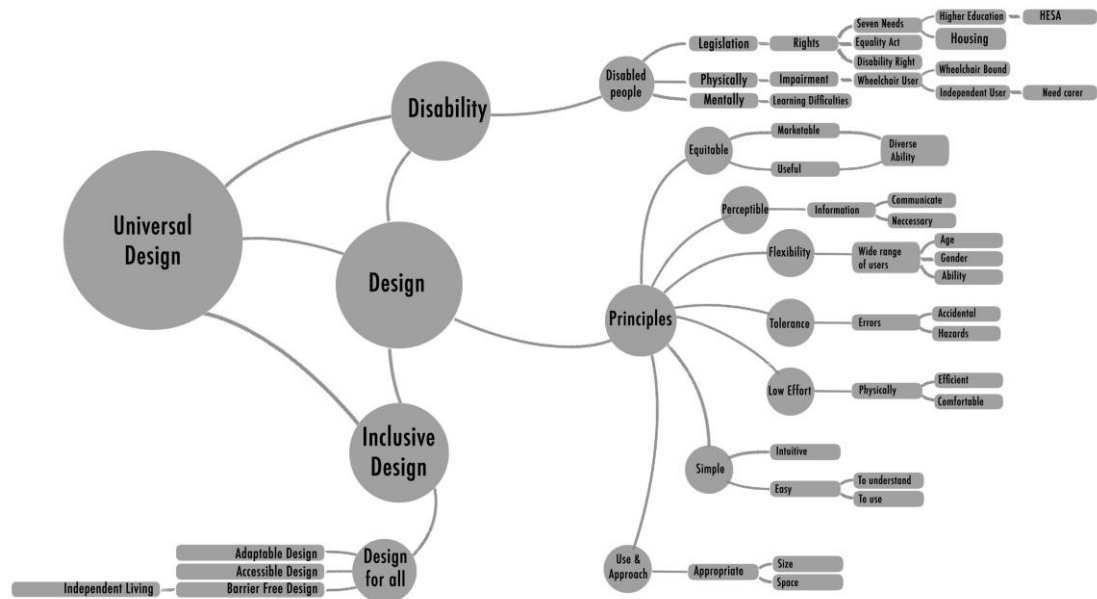


Figure 7: Mind map (Suteja, 2013)

- **Reflective Practice**

This reflective practice model allows informing and improving the understanding, practice and decision-making and also measuring the effect of the practice on the research. Moreover,, reflective practice model (Schon, 1983) allows practitioners accepting the un-expected situation for the result. Therefore, this model provides developing a better understanding of each idea stages and also enables a formal recording of action.

- **Concept Development**

The idea is minimizing the pattern at the wall and trying to make handles and the seat invisible when it is not being used. In this idea, functionality is highly considered, such as the multifunction of the handles, which can be used also as shelves. Handles can be moved, fold and twisted so it has a lot of possibilities and flexibility in function and appearance. Furthermore, the appearance also needs to be attractive when both disabled and ordinary people use it.

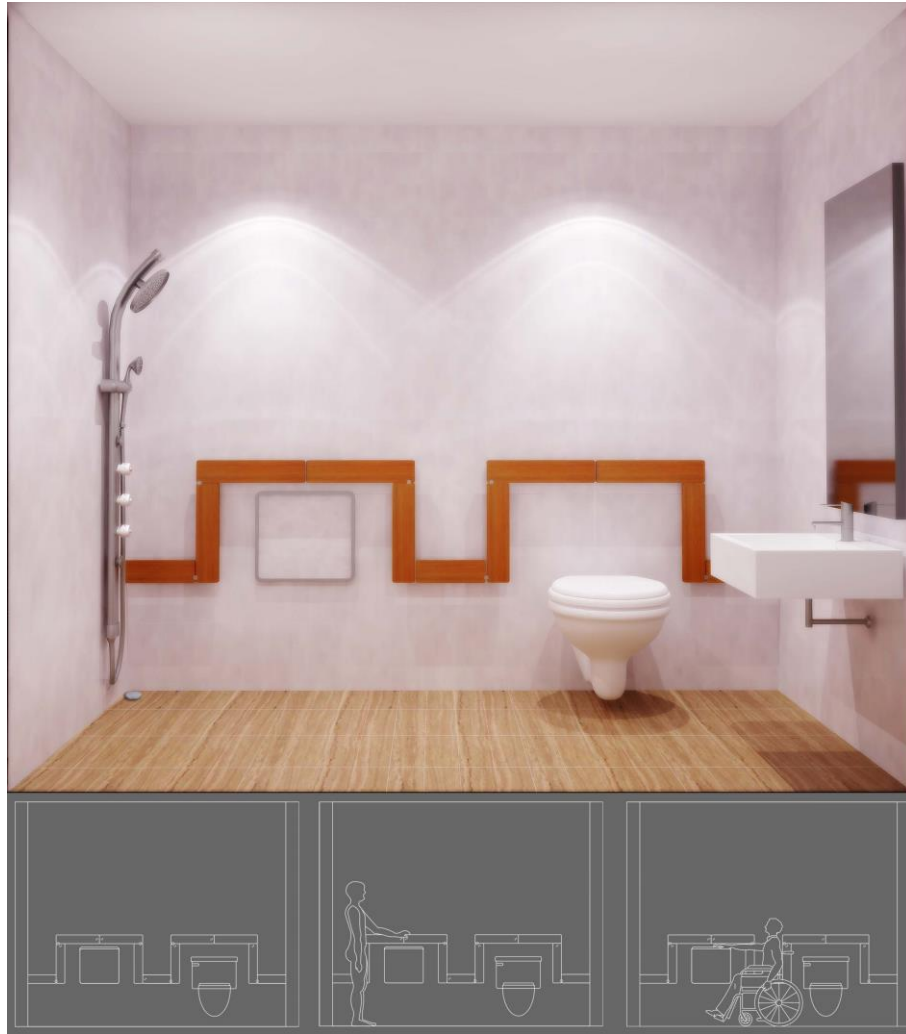


Figure 8: F2T as Flip, Fold and Twist (Suteja, 2013)

The final concept for this project is called F2T, stands for Flip, Fold and Twist. F2T is the solution for independent living for both wheelchair user and ordinary people. Furthermore, the concept also removes the medical look, typically appeared on the design for disabled. F2T will also be implemented with a push and pull lock system, in order to make a static and strong position while in used.

Moreover, the ergonomic and dimension of the F2T are highly considered for both wheelchair and the ordinary people. Hence, the user will feel comfortable over the functional product. The simplicity of F2T allows the product to be fit in numerous kind of bathroom, even in a small one.

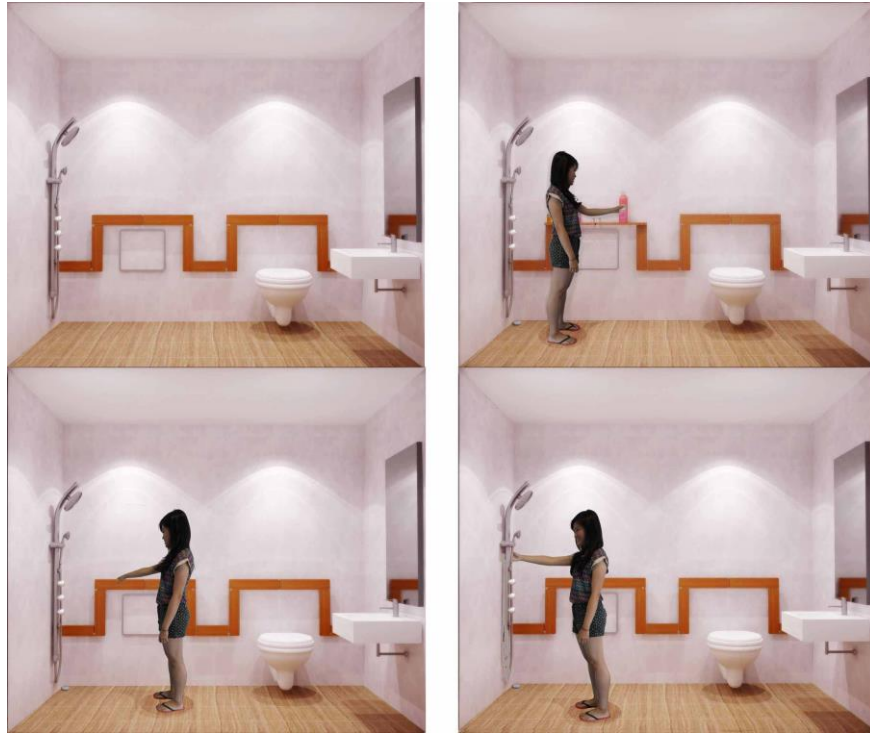


Figure 9: F2T for the bathroom used by ordinary people. (Suteja, 2013)

For ordinary people, it could be used as shelves for shampoos and soaps for bathing. The simplicity and the flexibility of F2T will not distract users' activities.



Figure 10: F2T for the bathroom used by wheelchair user. (Suteja, 2013)

For wheelchair users, F2T functions as handles as well as shelves. The strength of each segment of F2T allows it to be flipped, fold and twisted in many ways. Thus, it is strong enough to be used as handles to help the wheelchair user to move to the shower seat.



Figure 11: F2T for the bathroom used by wheelchair user. (Suteja, 2013)

Moreover, it could also be a transfer board to help the user to move from the wheelchair to the toilet. In addition, the simplicity of the F2T allows it to be used to attach the tissue holder, so it will help the wheelchair user to grab the tissue while using the toilet.

Conclusion

In summary, the purpose of this project was to create a design, which can be universally used by both disabled and ordinary people. This project also try to prove that universal design is not ugly, it can be attractive for ordinary people as well as functional for the people who have disability, in this case wheelchair users. On this project, research about student accommodation helped to achieve an understanding about the activities and the barriers that wheelchair users face in their living space. Different methods were conducted for the primary research to get deeper knowledge as well being creative and innovative as a designer.

Moreover, this project allows achieving new insight of being a designer does not only design what is beautiful and what she or he desires, but designer need to be aware of the environment as well as the users, design needs to create something to help improve the live of the people. Whereas in this project, the final design, F2T can be applied not only in bathroom in student accommodation but also in various areas for example in the public space. Therefore, this concept answers the need of independent living and is a solution for removing the medical language for disability.

In the future, universal design is believed to be survived as a good design because there will be likely no stigma for design for disabled. Therefore, this project is expected to be one of the examples of the universal design, which could improve the awareness about good design, which could be functional as well as, visually attractive.

Furthermore, this research is expected to be a case study for the universities in Indonesia, which concern about the student with special needs. There are some findings that are useful, and the final design that could be applied at the universities to be able to improve the independent living of the student who is physically disabled.

“Not consider their (people who have disability) needs mean that we potentially exclude them from the spaces that we design, which is not a moral position that designers can justify.” (Dodsworth, 2009).

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