UNIVERSITI PUTRA MALAYSIA

ASSESSING UNIVERSAL DESIGN PRINCIPLE APPLICATION ON CHILDREN PLAYGROUND AT LAKE TITIWANGSA PARK, KUALA LUMPUR

MARAL JAFARI

FRSB 2014 9
ASSESSING UNIVERSAL DESIGN PRINCIPLE APPLICATION ON CHILDREN PLAYGROUND AT LAKE TITIWANGSA PARK, KUALA LUMPUR

By

MARAL JAFARI

Thesis submitted to the School of Graduate Studies, Universiti Putra Malaysia, in fulfilment of the requirements for the degree of Master of Science

August 2014
COPYRIGHT

All material contained within the thesis, including without limitation text, logos, icons, photographs and all other artwork, is copyright material of Universiti Putra Malaysia unless otherwise stated. Use may be made of any material contained within the thesis for non-commercial purposes from the copyright holder. Commercial use of material may only be made with the express, prior, written permission of Universiti Putra Malaysia.

Copyright @ Universiti Putra Malaysia
DEDICATION

In The Name of God I declare that the thesis is my original work accepts for quotation and citation, which have been duly acknowledge. I also declare that it has not been previously and not concurrently submitted for any other degree at Universiti Putra Malaysia or other institution.

MARAL JAFARI

Date: August 2014
Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfilment of the requirement for the degree of Master of Science

ASSESSING UNIVERSAL DESIGN PRINCIPLE APPLICATION ON CHILDREN PLAYGROUND AT LAKE TITIWANGSA PARK, KUALA LUMPUR

By

MARAL JAFARI

August 2014

Chairman: Mohammad Yazah Bin Mat Raschid PHD
Faculty of Design and Architecture

The scope of this study includes all children with or without disability specific children with disability issues and the true concept of the Universal Design (UD) principle, as well as the value of playgrounds in the urban parks. The disabled children often face problems when utilising the public playgrounds participating in the activities and enjoying the areas due to the lack of sufficient equipment and space to supply their needs. The aim of this study is to examine the extent to which the children playground in Lake Titiwangsa Park, Kuala Lumpur has incorporated the UD principle and designed with ergonomic in the planning and designing the play equipment to support the all children with different disability ranging in age from 3 to 10. Physical site observations process such as the facilities measurement according to UD principle and ergonomic assessed with photographic documentation were conducted in Lake Titiwangsa Park playground apart from the semi-structured interview with the eleven experts in children playground design involve the landscape designers and policy makers. The data analysis techniques involved descriptive as well as the thematic analysis respectively for physical observation and semi structured interview. The results of this study demonstrate that despite the effort to incorporate the UD characteristics to support the all children with different ability in Lake Titiwangsa Park playground in, the integration of UD is found to be still lacking due to poor knowledge and understanding among designers and policy makers on UD principles and also their negative attitude sets towards the disabled children. The current thesis has not only assessed the physical playground equipment design in Lake Titiwangsa Park in relation to use of UD principle and ergonomic in supporting all children but also documented the comprehension of the UD amongst the designers and policy makers through their cognitions and experiences. The results of this thesis are however limited to the physical equipment, accessibility and the application of seven principles of the UD. Conclusively, this research finding could contributes to creating attentiveness and knowledge to designers and
policymakers to holistically incorporate the UD principles as way forward to enhance the development of the facilities for the disabled and abled in the future.
Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk ijazah.Master Sains

**MENILAI PERMOHONAN REKABENTUK UNIVERSAL TAMAN PERMAINAN UNTUK KANAK KANAK DI TAMAN TASIK TITIWANGSA, KUALA LUMPUR**

Oleh

**MARAL JAFARI**

**August 2014**

**Pengerusi:** Mohammad Yazah Bin Mat Raschid PHD
**Fakulti Rekabentuk dan senibina**

UD secara holistic sebagai satu jalan ke hadapan dalam meningkatkan pembangunan kemudahan untuk orang kurang upaya di masa hadapan.
ACKNOWLEDGEMENTS

I praise God for all His support in my entire life, gave me the opportunity to embark on my masters studies until submitting thesis. I owe everything to Him. I am heartily thankful to my supervisor, Dr Mohammad Yazah Bin Mat Raschid, whose encouragements, guidance and support from the initial to the final level enabled me to develop an understanding of this subject. Moreover, I gratefully thank the worthy contribution of my committee members Dr Mohd Yazid Mohd Yunos during this study.

I am thankful that this research has been supported by Universiti Putra Malaysia (UPM) which without that I would not have been able to engage in this research. Furthermore, this research could not be completed without the support of the Dewan Bandarraya Kuala Lumpur and individuals that were interviewed (Mr Vijayakumar, Mrs Asia Abdul, Mrs Citi Azura, Mr Nik Adlin Bin Hussain, Mr Abd Razak Ahmad, Mr Aznan Bin Mohd Nor, Mr Mond Fadzil Bin Non, Mrs Ainul Farida Binti Ariffin, Mr Mohd Nur Ihsan Ishak, Mrs Mahsuri Hamdin) along the way.

I would also like to thanks my family especially my parents who have been supporting me in terms of providing morale and motivation to complete the thesis in time.
APPROVAL

I certify that an Examination Committee has met on 3 March 2014 to conduct the final examination of Maral Jafari on her Master thesis entitled “Assessing the Universal Design Quality of Playground for Physically Disabled Children in Lake Titiwangsa Park, Kuala Lumpur.” in accordance with the Universities and University College Act 1971 and the constitution of the Universiti Putra Malaysia [P.U (A) 106] 15 March 1998. The Committee recommends that the student be awarded the degree of Master of Science.

Members of the Examination Committee were as follows:

Prof. Madya Lar. Dr. Noorizan bt Mohamed
Department of Landscape Architecture
Faculty of Design and architecture
Universiti Putra Malaysia
(Chairman)

Prof. Madya Dr. Kamariah binti Dola
Department of Landscape Architecture
Faculty of Design and architecture
Universiti Putra Malaysia
(Internal Examiner)

Prof. Madya Dr. Norsidah binti Ujang
Department of Landscape Architecture
Faculty of Design and architecture
Universiti Putra Malaysia
(Internal Examiner)

Assoc. Prof. Dr. Azilah binti Kasim
College of Art and Sciences
Faculty of Design and architecture
University
(External Examiner)

____________________________

Professor and Deputy Dean
School of Graduate Studies
University Putra Malaysia

Date:
This thesis was submitted to the Senate of Universiti Putra Malaysia and has been accepted in partial as fulfilment of the requirement for the degree of Master of Science. The members of the Supervisory Committee were as follows:

**Mohammad Yazah Bin Mat Raschid, PhD**

Faculty of Design and Architecture  
Universiti Putra Malaysia  
(Chairman)

**Dr Mohd Yazid Mohd Yunos, PhD**

Faculty of Design and Architecture  
Universiti Putra Malaysia  
(Member)

__________________________________________

Professor and Deputy Dean  
School of Graduate Studies  
Universiti Putra Malaysia

Date:
Declaration by Graduate Student

I hereby confirm that:

- this thesis is my original work;
- quotations, illustrations and citations have been duly referenced;
- this thesis has not been submitted previously or concurrently for any other degree at any other institutions;
- intellectual property from the thesis and copyright of thesis are fully-owned by Universiti Putra Malaysia, as according to the Universiti Putra Malaysia (Research) Rules 2012;
- written permission must be obtained from supervisor and the office of Deputy Vice-Chancellor (Research and Innovation) before thesis is published (in the form of written printed or in electronic form) including books, journals, modules, proceedings, popular writings, seminar papers, manuscripts, posters, reports, lecture notes, learning modules or any other materials as stated in the Universiti Putra Malaysia (Research) Rules 2012;
- There is no plagiarism or data falsification/fabrication in the thesis, and scholarly integrity is upheld as according to the Universiti Putra Malaysia (Graduate Studies) Rules 2003 (Revision 2012-2013) and the Universiti Putra Malaysia (Research) Rules 2012. The thesis has undergone plagiarism detection software.

Signature: _______________________________ Date: ______________________

Name and Matric No: ___________________________
Declaration by Members of Supervisory Committee

This is to confirm that:

- The research conducted and the writing of this thesis was under our supervision;
- Supervision responsibilities as stated in the Universiti Putra Malaysia (Graduate Studies) Rules 2003 (Revision 2012-2013) are adhered to.

Signature: ______________________
Name of Chairman of Supervisory Committee: ______________________

Signature: ______________________
Name of Member of Supervisory Committee: ______________________

Signature: ______________________
Name of Member of Supervisory Committee: ______________________

Signature: ______________________
Name of Member of Supervisory Committee: ______________________
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>DEDICATION iii</td>
</tr>
<tr>
<td>ABSTRACT iv</td>
</tr>
<tr>
<td>ABSTRAK vi</td>
</tr>
<tr>
<td>ACKNOWLEDGEMENTS viii</td>
</tr>
<tr>
<td>APPROVAL ix</td>
</tr>
<tr>
<td>DECLARATION xi</td>
</tr>
<tr>
<td>TABLE OF TABLES xvii</td>
</tr>
<tr>
<td>TABLE OF FIGURES xix</td>
</tr>
<tr>
<td>LISTS OF ABBREVIATIONS xxi</td>
</tr>
</tbody>
</table>

## CHAPTER

1 INTRODUCTION 1

1.1 Introduction 1

1.2 Background of the Study 1

1.3 Statement of the Problem 6

1.4 The Aim and Objectives 8

1.5 Research Question 9

1.6 The Expected Outcomes 9

1.7 Structure of the Thesis 12

2 LITERATURE REVIEW 14

2.1 Introduction 14

2.2 Universal Design 14

2.2.1 Theory of Universal Design 19

2.2.2 The Development of the Universal Design Principles 21

2.3 Malaysian Standards for Outside Building 26

2.3.1 Landscape 26

2.3.2 Handrails 27

2.3.3 Guiding Blocks 28

2.3.4 Parking 29

2.6 Playground 30

2.7 Urban Playground Environments 31

2.8 Playground Types 32

2.8.1 Traditional Playground 32

2.8.2 Contemporary Playground 33

2.8.3 Adventure Playground 34

2.9 The Roles of Natural Environments in Playgrounds 34

2.10 Public Playgrounds for Disabled Children 35

2.10.1 Integrated Playgrounds 36

2.10.2 The Safety of Children in Playgrounds 37

2.11 Ergonomic and Anthropometric 39

2.12 Playground and Ergonomic 41

2.12.1 Major Type of Playground Equipment’s 42

2.12 Summary 48
3 RESEARCH METHODOLOGY

3.1 Introduction
3.2 Research Framework
3.3 The Researcher as an Instrument
3.4 Research Ethics
3.5 Research Approach and Methodology
3.6 Case Study Research Methodology
3.7 Study Area Background
3.8 Research Questions
3.9 Proposition
3.10 Unit of Analysis
3.11 Criteria for Linking Data to Proposition
  3.11.1 Observation
  3.11.2 Observation Procedure
  3.11.3 Interviews
  3.11.4 Interviews Selections
  3.11.5 Participants
  3.11.6 Interview tools
  3.11.7 Interview Procedure
3.12 Criteria for Interpreting Data
  3.13 Validity
    3.13.1 Construct Validity
    3.13.2 External validity
    3.13.3 Internal Validity
3.14 Reliability

4 PHYSICAL OBSERVATION FINDING, ANALYSIS AND DISCUSSION

4.1 Introduction
4.2 Data Collection Method
4.3 Finding in Physical Observation
  4.2.1 Playground Equipment
  4.2.2 Playground Accessories
4.4 Discussions on the Findings and the Analysis of the Physical Observations
4.5 Conclusions

5 INTERVIEW RESULT, ANALYSIS AND DISCUSSION

5.1 Introduction
5.2 Method of Analysis
5.3 Interview Findings and Discussion
  5.3.1 Environmental Aspects
  5.3.2 Physical Design Characteristics
  5.3.3 Physically Disabled Children Right
  5.3.4 Organizational Factors
5.4 Summary of the interview analysis and discussions
5.5 Conclusions
6 SUMMARY OF THE FINDINGS, CONCLUSIONS AND RECOMMENDATIONS
   6.1 Introduction 169
   6.2 Reflecting on the Methodological Approach 169
   6.3 Implementation of finding 175
   6.3 Limitations of the study 176
   6.4 Recommendations for the Future Study 177
   6.5 Knowledge Contribution 178

REFERENCES 180
APPENDIX 190
## LIST OF TABLES

<table>
<thead>
<tr>
<th>Table Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Table 2.1. Summary of principle 1 in universal design</td>
<td>13</td>
</tr>
<tr>
<td>Table 2.1. Summary of principle 2 in universal design</td>
<td>13</td>
</tr>
<tr>
<td>Table 2.2. Summary of principle 3 in universal design</td>
<td>13</td>
</tr>
<tr>
<td>Table 2.3. Summary of principle 4 in universal design</td>
<td>14</td>
</tr>
<tr>
<td>Table 2.4. Summary of Principle 5 in Universal Design</td>
<td>14</td>
</tr>
<tr>
<td>Table 2.5. Summary of Principle 6 in Universal Design</td>
<td>15</td>
</tr>
<tr>
<td>Table 2.6. Summary of Principle 7 in Universal Design</td>
<td>15</td>
</tr>
<tr>
<td>Table 2.7. Safety Guidelines for Public Playgrounds</td>
<td>23</td>
</tr>
<tr>
<td>Table 3.1. Participants’ Profiles</td>
<td>51</td>
</tr>
<tr>
<td>Table 3.2. Summary of Adapted Validation and Reliability Strategies</td>
<td>59</td>
</tr>
<tr>
<td>Table 4.1 Monkey Bar Observations and Analysis</td>
<td>63</td>
</tr>
<tr>
<td>Table 4.2 Spinning Tops Observations and Analysis</td>
<td>65</td>
</tr>
<tr>
<td>Table 4.3 Spring Rockers Observations and Analysis</td>
<td>67</td>
</tr>
<tr>
<td>Table 4.4 Long and Short Suspension Bridges Observations and Analysis</td>
<td>69</td>
</tr>
<tr>
<td>Table 4.5 Ladders Observation and Analysis</td>
<td>71</td>
</tr>
<tr>
<td>Table 4.6 Inclined Ramps Observations and Analysis</td>
<td>73</td>
</tr>
<tr>
<td>Table 4.7 Slider and Twist Slider Observation and Analysis</td>
<td>75</td>
</tr>
<tr>
<td>Table 4.8 Swing Observation and Analysis</td>
<td>77</td>
</tr>
<tr>
<td>Table 4.9 Entrance Observation and Analysis</td>
<td>79</td>
</tr>
<tr>
<td>Table 5.1 Space Expansion Codes</td>
<td>88</td>
</tr>
<tr>
<td>Table 5.2 Disabled Friendly Ambiance Codes</td>
<td>90</td>
</tr>
<tr>
<td>Table 5.3 Additional Services for Handicapped Children Codes</td>
<td>91</td>
</tr>
<tr>
<td>Table 5.4 Accessibility Codes</td>
<td>94</td>
</tr>
<tr>
<td>Table 5.5 Ease of Use Codes</td>
<td>97</td>
</tr>
<tr>
<td>Table 5.6 Safety and Security Codes</td>
<td>99</td>
</tr>
<tr>
<td>Table 5.7 Change Attitude among Public</td>
<td>102</td>
</tr>
<tr>
<td>Table 5.8 Change Attitude among Officials and Manufactures Codes</td>
<td>104</td>
</tr>
<tr>
<td>Table 5.9 Consideration of Physically Disabled Children’s Needs Codes</td>
<td>106</td>
</tr>
<tr>
<td>Table 5.10 Fund Investment Codes</td>
<td>108</td>
</tr>
<tr>
<td>Table 5.11 Universal Design Knowledge and Expertise</td>
<td>110</td>
</tr>
</tbody>
</table>
# LIST OF FIGURES

<table>
<thead>
<tr>
<th>Figure</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Figure 1.1. Playground Experiences, Play and Usability as Trans Active and Overlapping Concepts to Promote Inclusivity</td>
<td>4</td>
</tr>
<tr>
<td>Figure 1.2. Five Components of the Case Study to Summarize the Research Design</td>
<td>12</td>
</tr>
<tr>
<td>Figure 2.1. Conceptual Framework</td>
<td>33</td>
</tr>
<tr>
<td>Figure 3.2. Methodological Frameworks for Study</td>
<td>36</td>
</tr>
<tr>
<td>Figure 3.3. Distribution of Open Spaces, Recreational and Sports Facilities in Federal Territory, 2000</td>
<td>38</td>
</tr>
<tr>
<td>Figure 3.4. Lake Titiwangsa Park Location in Kuala Lumpur Map</td>
<td>39</td>
</tr>
<tr>
<td>Figure 3.5. Playground Location in Lake Titiwangsa Park</td>
<td>39</td>
</tr>
<tr>
<td>Figure 3.6. Serene View of Lake Titiwangsa Park</td>
<td>40</td>
</tr>
<tr>
<td>Figure 3.7. Views towards Jogging Track of Lake Titiwangsa Park</td>
<td>40</td>
</tr>
<tr>
<td>Figure 3.8. View along the Seating Area of Lake Titiwangsa Park</td>
<td>40</td>
</tr>
<tr>
<td>Figure 3.9. View toward Pedal Boat Station of Lake Titiwangsa Park</td>
<td>40</td>
</tr>
<tr>
<td>Figure 3.10. Views towards Kuala Lumpur Sky Line from Lake Titiwangsa Park</td>
<td>39</td>
</tr>
<tr>
<td>Figure 3.11. View toward First Playground from Lake Titiwangsa Park</td>
<td>41</td>
</tr>
<tr>
<td>Figure 3.12. Views toward Second Playground in Lake Titiwangsa Park</td>
<td>42</td>
</tr>
<tr>
<td>Figure 3.13. View toward Third Playground Equipment in Lake Titiwangsa Park</td>
<td>43</td>
</tr>
<tr>
<td>Figure 3.14. Observation Tools</td>
<td>48</td>
</tr>
<tr>
<td>Figure 4.1. Location of three playground</td>
<td>61</td>
</tr>
<tr>
<td>Figure 4.2. Monkey Bar High</td>
<td>62</td>
</tr>
<tr>
<td>Figure 4.3. Location of Monkey Bar Apart From Other Equipment</td>
<td>62</td>
</tr>
<tr>
<td>Figure 4.4. Spinning Tools High</td>
<td>64</td>
</tr>
<tr>
<td>Figure 4.5. Spinning Tools</td>
<td>64</td>
</tr>
<tr>
<td>Figure 4.6. Spring Rockers High</td>
<td>66</td>
</tr>
<tr>
<td>Figure 4.7. Location of Spring Rockers Apart From Other Equipment</td>
<td>66</td>
</tr>
<tr>
<td>Figure 4.8. Short suspension Bridge</td>
<td>67</td>
</tr>
<tr>
<td>Figure 4.9. Ladder High</td>
<td>67</td>
</tr>
<tr>
<td>Figure 4.10. Ladder Location</td>
<td>69</td>
</tr>
<tr>
<td>Figure 4.11. Ramps width</td>
<td>69</td>
</tr>
<tr>
<td>Figure 4.12. Ramp High and Location</td>
<td>71</td>
</tr>
<tr>
<td>Figure 4.13. Sliders High</td>
<td>71</td>
</tr>
<tr>
<td>Figure 4.14. Twist Sliders High and Location</td>
<td>73</td>
</tr>
<tr>
<td>Figure 4.15. Swings High and Location</td>
<td>73</td>
</tr>
<tr>
<td>Figure 4.16. Swings</td>
<td>75</td>
</tr>
<tr>
<td>Figure 4.17. First Entrance</td>
<td>75</td>
</tr>
<tr>
<td>Figure 4.18. Second Entrance</td>
<td>77</td>
</tr>
<tr>
<td>Figure 4.19. Third Entrance</td>
<td>77</td>
</tr>
<tr>
<td>Figure 4.20. Different Access to Titiwangsa Playground</td>
<td>79</td>
</tr>
<tr>
<td>Figure 4.21. Guiding Blocks</td>
<td>79</td>
</tr>
<tr>
<td>Figure 4.22. Parking</td>
<td>81</td>
</tr>
</tbody>
</table>
Figure 5.1. Summary of Interview Analysis Based on Environmental Aspect 112
Figure 5.2. Summary of Interview Analysis Based on Physical Design Characteristic 113
Figure 5.3. Summary of Interview Analysis Based on Disable Children’s Right 114
Figure 5.4. Summary of Interview Analysis Based on Organizational Factors 115
Figure 6.1. Summaries of the Factors the Influence the Design Process 118
Figure 6.2. Summaries of the Issues and Problem Contributing to the Constraints Adapting the Universal Design Principles 119
LISTS OF ABBREVIATIONS

<table>
<thead>
<tr>
<th>Term</th>
<th>Abbreviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Universal Design</td>
<td>UD</td>
</tr>
<tr>
<td>National Institute on Disability and Rehabilitation Research</td>
<td>NIDRR</td>
</tr>
<tr>
<td>Product Safety Commission</td>
<td>CPSC</td>
</tr>
<tr>
<td>Kuala Lumpur Structure Plan</td>
<td>KLSP</td>
</tr>
<tr>
<td>Malay abbreviation for ‘Orang Kurang Upaya’</td>
<td>OKU</td>
</tr>
<tr>
<td>Union of the Physically Impaired Against</td>
<td>UPIAS</td>
</tr>
<tr>
<td>Dewan Bandaraya Kuala Lumpur</td>
<td>DBKL</td>
</tr>
<tr>
<td>Departments of Standards Malaysia</td>
<td>DSM</td>
</tr>
<tr>
<td>Malaysian Standards</td>
<td>MS</td>
</tr>
<tr>
<td>Draft International Standard</td>
<td>DIS</td>
</tr>
<tr>
<td>Accessibility Standards</td>
<td>ASA</td>
</tr>
</tbody>
</table>
CHAPTER 1

INTRODUCTION

1.1 Introduction

The first section of this chapter introduces the research background, statement of the problem, as well as the aim, objectives, and assumptions of this study. It also outlines the qualitative research approach employed within the case study methodology. Furthermore, the final section of this chapter elaborates on the scope, outcomes, and significance of the conducted research along with outlining the thesis structure.

1.2 Background of the Study

The concept of the Universal Design (UD) has changed the minimum standards for the building codes to incorporate products as well as building features, which to the greatest extent possible, can be used by everyone (Mace, 1997). Today, plans which follow the UD model; for objects and spaces used by the public, integrate elements that address as many needs as possible to accommodate the broadest spectrum of the users instead of the selected groups (Rodman, et al. 2010). Two public samples of the UD include the accessible picnic table and the common accessible ramp that are used in conjunction with the stairs. Together, they are usable by a majority of people irrespective of their abilities (Mace, 1997).

The UD influences the values that support national and regional planning significances and it can be added as a principle at any stages of planning system which create functional, inclusive, responsive, and sustainable towns (Scotia, 2013). According to Falvo (2007), the UD is defined as a concept that rose to popularity in the past era. It is also defined as creating products beneficial for many people and applied to specific requirements of the populations and those with varied preferences or learning styles. This concept applies to the design of physical environments, interfaces, and products. Parallel to this, Play and learning Adaptable Environment (1993) pinpointed that a community which is planned and designed to accommodate all of its citizens would celebrate the potential, quality of life, and diversity of abilities. Such a community also reaps social and financial benefits when the citizens can enter businesses, cross streets, attend games and concerts, or participate in outdoor recreations (Scotia, 2013).

The organizational model called UD combines the accessibility, adaptability, inclusivity, and freedom from barriers to allow all the degrees of sensory awareness,
all types of movements, and all levels of physical and intellectual functions (Play and learning Adaptable Environment, 1993). It needs to be underlined that the disability cannot be considered in isolation. Indeed, it cuts across all the aspects of a child’s life having very different implications at various stages in a child's life cycle (United Nation Children's Fund, 2007). In addressing such a challenge, this study endeavours to make inclusive of the UD principles to support both stages of the child’s life cycle. As Perry (2001) stated, “Play takes many forms, but the heart of the play is pleasure – an important component in learning”.

Many specialists, however, agree on a working approximation of giving a minimum benchmark of 2.5 per cent of children aged 0-14 with self-evident moderate to severe levels of sensory, physical and intellectual impairments (United Nation Children's Fund, 2007). The world organization further stressed that underestimating the potential of children with severe or complex impairments is perhaps the greatest obstacle: experience has revealed that all the children can be helped to find the means to express meaningful choices and preferences. Consistent with this, Imrie and Hall, (2001) established that the policies, values, and practices of the individuals who are responsible in creating the built environment would also contribute to the people with disabilities excluding from the mainstream. Similarly, the ones who manage a public space or a public building can be seen as a noteworthy agent in providing the visitors with a conspicuous barrier-free environment. As a consequence, it is indispensable to take into account the risk of the playground injury which gives a rise to the number of inappropriate usage from the playground tools.

In all fairness, if it is possible for children to be encouraged to use the equipment appropriately through supervision, they will accordingly experience fewer injuries (Chelvakumar et al. 2010). On the other hand, children with disabilities are faced with many challenges affecting their future social lives and spiritual health, such as poor facilities into their peers play. The Playgrounds are old-style sites for the communications of the youth while the playground designs often times need different children to use the equipment and sit on the side-lines (Sharika et al. 2003).

A model was proposed by Ripat and Becker, (2012), exhibited in Figure 1.1, for having great playground experiences, play, and usability with active and overlapping concepts to encourage inclusivity. They mentioned that for studying the ‘Playground’ theme, it is essential to emphasize the significance of the playground and the person’s experiences underline the developmental physical and social aspects. The outdoor play is considered as a key occupation of the children while the occupational therapists have a role in promoting the usable environments for all of the children.
Ripat and Becker (2012) highlighted that during the past two decades, the literature that has emphasized the chances for all the children to play has decreased while the focus has been directed more on children’s participation in scheduled and academics activities (Quisenberry et al., 2002). Meanwhile, the USA Affiliate of the International play association (2012) and (Ginsburg, 2007; and Hillary Burdette, 2005) asserted that most children have passive play opportunities, such as playing computer games and video games. Ripat and Becker (2012) also displayed the model for having great playground experiences, play, and usability with active and overlapping concepts to encourage inclusivity.

The necessities of promoting inclusive playground experiences have initiated the study to investigate the UD quality and ergonomic guidelines in Lake Titiwangsa Park playgrounds. As a landscape designer, it is imperative to understand the challenges and opportunities of incorporating the UD principles to improve the facilities for supporting all children. There is a need to assess whether the play equipment for the all children with any ability in the playground areas in Malaysia is being met in terms of ergonomic and UD principle by specifically selecting the Lake Titiwangsa Park playground, a premier public park in Kuala Lumpur as the representative case study area.

It is imperative for this study to fill the knowledge gap in designing a playground appropriate for both the physically disabled children and the able children. This
relates to the notion that the UD principles as well as ergonomic guidelines should be applied in the playground equipment to create a holistic inclusive design for all the children regardless of their health status. In the case of this study, the terms of guidelines specified in the Consumer Product Safety Commission (CPSC) playground handbook and the Universal Design Principles (UDP) will be extensively used as references.

1.3 Statement of the Problem

Many studies have confirmed that the number of individuals with disabilities is on the rise. To be precise, the number of young individuals is escalating correspondingly giving a rise to the needs of the individuals with disabilities. As society ages, those who are responsible for constructing the barriers will become aware of their actions and what our culture defines as “normal” will continue to evolve (Devlin, 2010). It is now the time to take a measure and become educated on the principles and applications of the Universal Design and Accessibility (Devlin, 2010). To date, there is insufficient incorporation of the UD in the design education as the majority of the participants do not know the concept and its content (Helvacioglu & Karamanoglu, 2012). According to Bickenbach (Bickenbach et al, 1999; Metts, 2004), this issue could be a result of ignorance in the policy making system and the physical barriers they encounter in the built environment as well as a lack of the designer’s awareness of the UD. Moreover, Imrie and Hall (2001) contend that the policies, practices, and values of the professionals who create the built environment are the main contributors to the barriers in architecture (Imrie and Hall, 2001).

As a result, the lack of the UD implementation in most projects has resulted in ignoring the disabled individuals’ needs; especially the children. In line with the Kuala Lumpur Structure Plan (2020), the standards of provision of facilities and utilities in low cost housing such as children’s playgrounds including Lake Titiwangsa Park, reading rooms, community facilities and open space are inadequate to meet the needs of the residents. Although there are local parks, children playground, soccer fields are not distributed in the strategic zones evenly according to the population distribution. In many cases, even though the community facilities are adequately provided, they are under-utilized due to inadequate maintenance, vandalism, and poor accessibility. This situation has particularly affected some children’s playgrounds, soccer fields and sport facilities. To compound the issue, the need for the special schools as well as playground soccer fields for the disabled children must be also planned to meet the required criteria such as selecting suitable locations and decent designs with adequate provision of facilities and equipment (DBKL, 2004).

Designing for all the children means creating the environment to be usable by all the children without the need for adaptation. It also implies that the environments are
free from both physical and social barriers (Imrie and Hall, 2001). The subsequent list of key elements can be used by designers, architects, and early childhood staff in creating the environments that are inviting and functional to every child (White et al. 2008; and White & Stoecklin, 1998). Existing standards and guidelines are inadequate to prevent injuries which are a major source of morbidity on playgrounds (Vollman et al. 2009). Pre-conceptions or lack of open discussions on disability sometimes results in children with disabilities being overlooked in the planning and provision of the services (Devlin, 2010).

While designing for children, perceiving the special needs would enable the designers to improve good products in direction of developing both mental activities and creativity (Amouzegar, et al 2010). Corresponding to this, Yilmaz & Bulut (2007) elucidated that more efficient playgrounds where children can play securely must be constructed. It is also pronounced that improving and constructing well-equipped public Playgrounds for children with disabilities in Malaysia’s public playgrounds is indispensable (Soltani et al. 2012). Furthermore, the society should commence the inclusion and removal of negative barriers from the able bodied and disabled ones towards each other, from the individuals’ early age or childhood (Abdou, 2011). Therefore, it is imperative for this study to fill the gap between disabled and abled children in playground areas with the notion that the UD principle should be applied to the playground equipment with the aim of creating a holistic inclusive design for children.

1.4 The Aim and Objectives

The aim of this study is to assess the UD qualities and ergonomic guidelines for the physical equipment and accessory facilities of the children playgrounds in Lake Titiwangsa Park in order to evaluate the most appropriate design for children. It is vital to understand the extent to which the universal playground design principles and ergonomic guidelines have been incorporated in order to support all able and disabled children. In a macro perspective, the study will also provide the insight on the method by which the playgrounds in Malaysia incorporate the UD principles by referring to Lake Titiwangsa Park playground as the selected case study area.

In accordance with the research questions, the following objectives will be achieved in this study:

1. To assess the physical equipment and accessibility of children playground in Lake Titiwangsa Park in accordance to the universal design principle and ergonomic guidelines.
2. To understand the experts and policymakers’ views on the integration of the UD design principles and the barriers in the design of children playground in Lake Titiwangsa Park.

1.5 Research Question

Based on the aforementioned problem, this study has established two research question as follows:

RQ1: What are the prevailing physical UD principle and ergonomic guidelines which are being implemented in the existing playground equipment in Lake Titiwangsa Park?

RQ2: What are the experts and policy maker’s views on the integration of the UD design principles and barrier on in Lake Titiwangsa Park children playgrounds?

1.6 The Expected Outcomes

This study provided a theoretical foundation determining the extent of the integration of the UD principles in Lake Titiwangsa Children playground in supporting the all children along with several recommendations to improve the playgrounds. It evaluated the physical equipment as well as accessories in the playgrounds and validates the manner the UD principle has been used to design the playground. The study evaluated playground the design guidelines based on the UD principles and ergonomic guild lines in order to evaluate the most appropriate design for children. Most importantly, it also highlighted the necessity of understanding the children’s rights and the UD knowledge for future playground project implementations.

The case study research methodology is categorized into five major components, namely the research questions, proposition, the unit of analysis, and the criteria for linking the data to proposition as well as the criteria of interpreting the findings as highlighted in (Figure 1.2.) it will be explain in chapter 3.
**Research question**

RQ1: What are the prevailing physical UD principle and ergonomic guidelines which are being implemented in the existing playground equipment in Lake Titiwangsa Park?  
RQ2: What are the experts and policy maker’s views on the integration of the UD design principles and barrier on in Lake Titiwangsa Park children playgrounds?

**Study Proposition**

The Universal design can consummate an effective design in playgrounds due to its ability to support physically disable children

**Unit of Analysis**

Professional landscape designers and policy makers

**Logic of Linking Data to Proposition**

- Literature + observation to answer RQ1  
- A Semi structure interview to answer RQ2

**Criteria for Interpreting the Findings**

- A Case study setup for data collection  
- Qualitative analyses for observation and interview

---

*Figure 1.2. Five Components of the Case Study to Summarize the Research Design*

Source: (Author, 2013)
1.7 Structure of the Thesis

This thesis is divided into six chapters. Chapter 1 introduces the research background, statement of the problem, the aim and objective along with the research assumptions. In effect, Chapter 1 acts as a guideline for the research subsequent stages of actions.

Chapter 2 reviews the relevant literatures and reputable theories of the related filed majorly dealing with the UD, playgrounds, ergonomic, and the case areas. Finally, the chapter summarizes the important findings in the literature.

Chapter 3 describes the methodological framework and approaches adopted in this study, the conducted research process, and the way the inquiries were structured. It highlights the qualitative facet of the study and enumerates the conducted case study inquiries which include observations and interviews to address the predetermined sub-research question. The chapter ends with supporting the reliability and validity of the conducted experiment.

Chapter 4 presents the study’s results and analysis in the physical observation data collection process. Meanwhile, the qualitative data analysis will reply the descriptive analysis of the data collected. It also includes the discussions of the main findings of the observation method.

Chapter 5 presents the study’s results and analysis in the interview data collection method. The qualitative data analysis employed is the thematic analysis. This chapter also discusses the main findings related to the interviews with the design experts and policymakers.

Finally, in chapter 6, a summary of the whole thesis and its main findings are presented along with discussing the outcomes of this case study and presenting the findings associated with the three sub-research questions. It also highlights the significance of incorporating the UD principles to playgrounds and makes recommendation for further studies to be done in the research study area.
REFERENCES


Nurrabiatul, A (2014), Assessment on space and furniture’s ergonomics for children in kindergarten.


132


