

**A REVIEW ON INTERIOR DESIGN ELEMENTS AT
SELECTED DYSLEXIA CENTRE IN FORMULATING
INTERIOR DESIGN FRAMEWORK FOR DYSLEXIA
LEARNING ENVIRONMENT**

BY

RUSHDINA BINTI IZHAM

**A thesis submitted in fulfilment of the requirement for the
degree of Master of Science (Built Environment)**

**Kulliyyah of Architecture and Environmental Design
International Islamic University Malaysia**

MAY 2022

ABSTRACT

Currently there is an act by the government towards improving the state of education for disabled learners in Malaysia. Most Dyslexia centre in Malaysia not originally built as a function for the disabled learners and need to renovate to fit the purpose of learning space for children with dyslexia. Thus, the buildings are facing uncomfortable issues in term of inefficient design of the respective building and facilities available. Dyslexia children nowadays spend most of their time and play within the building, therefore, the building needs to be designed following on the specification of dyslexia children's needs because it is essential for their achievement and optimum development in their learning process. The objectives of this research are to identify and determine important interior design elements for the interior spaces of Dyslexia Centers and to formulate an interior framework for the centre based on the identified element from both literatures and direct assessment. Drawing from the objectives, this study aims to create a valid interior design framework that can be the best practice for the centre according to the ecology of the centre and the needs of the target user. This research is conducted using four (4) selected case study approach and data collection will draw attention to interior design setting of selected dyslexia centre using a checklist on facility condition assessment checklist. Direct observation is adopted for analysis on the selected case studies. A semi-structured interview with the principal and teachers also adopted for data collection method while analysis was done based on the study on literature too. The research found that there are four (4) interior design elements that are important to make up an effective interior design setting for dyslexia learning environment, which are; space planning and facilities, colour scheme, materials used and windows and openings. These interior design elements very important to study in-depth in relation to learning environment, specifically for dyslexia children as it is found that most of the visited dyslexia centre did not provide a suitable interior design setting that can stimulate learning process for dyslexic students. The findings are expected to become a reference point for Dyslexia Centres to improve their learning environment condition prior to the spectrums and appropriate interior design elements as supporting environment corrective method to the centres.

خلاصة البحث

يوجد حالياً إجراء من قبل الحكومة لتحسين حالة تعليم المتعلمين المعوقين في ماليزيا. ومعظم مراكز عسر القراءة في ماليزيا لم يتم بناؤها في الأصل كوظيفة للمتعلمين المعاقين حيث تحتاج إلى تجديدها لتلائم الغرض من مساحة التعلم للأطفال الذين يعانون من عسر القراءة. وبالتالي، تواجه المباني مشكلات غير مريحة من حيث التصميم غير الفعال للمبنى المعني والمرافق المتاحة. كما يقضي أطفال عسر القراءة في الوقت الحاضر معظم وقتهم ويلعبون داخل المبنى. لذلك، يجب تصميم المبنى وفقاً لمواصفات احتياجات الأطفال الذين يعانون من عسر القراءة لأنه ضروري لتحقيقهم وتطويرهم الأمثل في عملية التعلم الخاصة بهم. تتمثل أهداف هذا البحث في تحديد وتحديد عناصر التصميم الداخلي المهمة للمساحات الداخلية لمراكز عسر القراءة وصياغة إطار داخلي للمركز بناءً على العنصر المحدد من كل من الآداب والتقييم المباشر. بالاعتماد على الأهداف، تهدف هذه الدراسة إلى إنشاء إطار عمل صالح للتصميم الداخلي يمكن أن يكون أفضل ممارسة للمركز وفقاً لبيئة المركز واحتياجات المستخدم المستهدف. يتم إجراء هذا البحث باستخدام أربعة (4) مناهج دراسة حالة مختارة، وسوف يلفت جمع البيانات الانتباه إلى إعداد التصميم الداخلي لمركز عسر القراءة المختار باستخدام قائمة مراجعة على قائمة مراجعة تقييم حالة المنشأة. كما تم اعتماد المراقبة المباشرة لتحليل دراسات الحالة المختارة. تم اعتماد مقابلة شبه منظمة مع المدير والمعلمين أيضاً لطريقة جمع البيانات بينما تم إجراء التحليل بناءً على الدراسات السابقة أيضاً. وجد البحث أن هناك أربعة (4) عناصر للتصميم الداخلي مهمة لتشكيل إعداد تصميم داخلي فعال لبيئة تعلم عسر القراءة، وهي؛ تخطيط المساحات والمرافق، نظام الألوان، والمواد المستخدمة والنوافذ والفتحات. تعتبر عناصر التصميم الداخلي هذه مهمة جداً للدراسة المتعمقة فيما يتعلق ببيئة التعلم، خاصة للأطفال الذين يعانون من عسر القراءة حيث وجد أن معظم مركز عسر القراءة الذي تمت زيارته لم يوفر إعداداً مناسباً للتصميم الداخلي يمكن أن يحفز عملية التعلم للطلاب الذين يعانون من عسر القراءة. من المتوقع أن تصبح النتائج نقطة مرجعية لمراكز عسر القراءة لتحسين ظروف بيئة التعلم الخاصة بهم قبل الأطياف وعناصر التصميم الداخلي المناسبة كطريقة داعمة لتصحيح البيئة للمراكز.

APPROVAL PAGE

I certify that I have supervised and read this study and that in my opinion, it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a thesis for the degree of Master of Science (Built Environment)



.....
Nurlelawati Binti Ab. Jalil
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.....
Nurhaya Baniyamin
Internal Examiner

.....
Zalina Samadi
External Examiner

This thesis was submitted to the Department of Applied Arts and Design and is accepted as a fulfilment of the requirement for the degree of Master of Science (Built Environment)

.....
Fadzli Irwan bin Bahrudin
Head, Department of Applied
Arts and Design

This thesis was submitted to the Kulliyyah of Architecture and Environmental Design and is accepted as a fulfilment of the requirement for the degree of Master of Science (Built Environment)

.....
Abdul Razak bin Sopian
Dean, Kulliyyah of Architecture
and Environmental Design

DECLARATION

I hereby declare that this thesis is the result of my own investigations, except where otherwise stated. I also declare that it has not been previously or concurrently submitted as a whole for any other degrees at IIUM or other institutions.

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ACKNOWLEDGEMENTS

Alhamdulillah, I would like to express my gratitude to my supervisor, Ts Dr. Nurlelawati Ab. Jalil for the continuous inputs, guidance, advice and patience in supervising me for this thesis. I believe that the knowledge and supports that you have delivered not only benefited this thesis but also will stay inside me for my future. Thank you very much.

I wish to express my appreciation and thanks to all the academic staff and support staff in Postgraduate Office Department for their willingness to provide essential letter for my data collection phases and all the needed documents for submission. I am also grateful for the cooperation and supports given by all the experts I have met in this research journey, and also to all the participants of the interviews such as teachers and staff at Dyslexia Centres. This research would not be completed without their cooperation and supports.

It is my utmost pleasure to dedicate this work to my dearest parents, Almarhum Tuan Haji Izham Bin Ahmad and Puan Hajjah Asmah Binti Dollah who has constantly encouraged and prayed for me from afar to further my master study. This is my little gift which can never be compared to your love and sacrifice. To all my other family members, who granted me the gift of their unwavering belief in my ability to accomplish this goal: thank you for all of your support, help and patience. All of you mean a lot to me.

Lastly but most importantly, my never-ending thanks and loves goes to my beloved husband who always be there during happy and difficult times. His willingness, patience and sacrifices to help out to complete my research studies and be a supportive partner for me when in need. This is my appreciation for all the words and helps. You are truly an amazing partner for me. To my children, Sofiyya Azzahra' and Suhayl 'Aafii who always lightened my days and nights in this journey; and sacrificed their longing for Ummi in my absence while I am away to complete my master research journey. This is a book of remembrance for you to stay strong and never give up in achieving your dreams in the future. All of you are the greatest gift that Allah has given to me in this world.

Once again, we glorify Allah for His endless mercy on us one of which is enabling us to successfully round off the efforts of writing this thesis. Alhamdulillah

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CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND STUDY

This thesis deals with the early recognition about dyslexia children learning environment in Malaysia and how to help them in their learning process by reviewing the existing dyslexia centers around Klang Valley area on its interior setting in order to formulate a friendly interior design element to support their learning experience. This is one of the initiatives in research area to support one of four (4) in The Malaysia Education Blueprint 2012-2025 that recognizes the need to strengthen existing foundations of special education programs through provisioning adequate resources, including financial and other essential school infrastructure as well as facilities for special education children (as cited by S. Pillai in The Star, 2021). However, the situation of most kindergarten buildings in Malaysia today not originally built as a function of kindergarten and need to renovate to fit the purpose of learning space for children (Fitrynadia M.S et. al, 2020). This situation is the same with existing dyslexia centre and school's buildings in Malaysia. This may give the impact of uncomfortable environment to the children such as receiving stack air within the building which may expose them to poor air quality that lead to bad health and providing the children with limited space for them to move around (Kamaruzzaman S. N, Nor Hanim, et. al (2011), Mohidin H, Ismail. Et. al (2015) and Kamaruzzaman S.N, Razak R. A (2011)). All of these impacts happened due to the renovating activity. Through this research initiative, it is hoped to be able to promote an efficient interior design specifically for dyslexia

children and generally foster designers to design more friendly buildings for kindergarten children.

The fact that there are increasing demands for a proper dyslexia learning environment undeniable because it is believed that the prevalence of children with dyslexia is expected to increase from year to year. Malaysian statistics indicated that from total estimation of 4.5 million children below the age of 18 years old in year 2017, almost 5% have learning incapacity due to reading disability known as dyslexia (Sinnadurai, 2018).

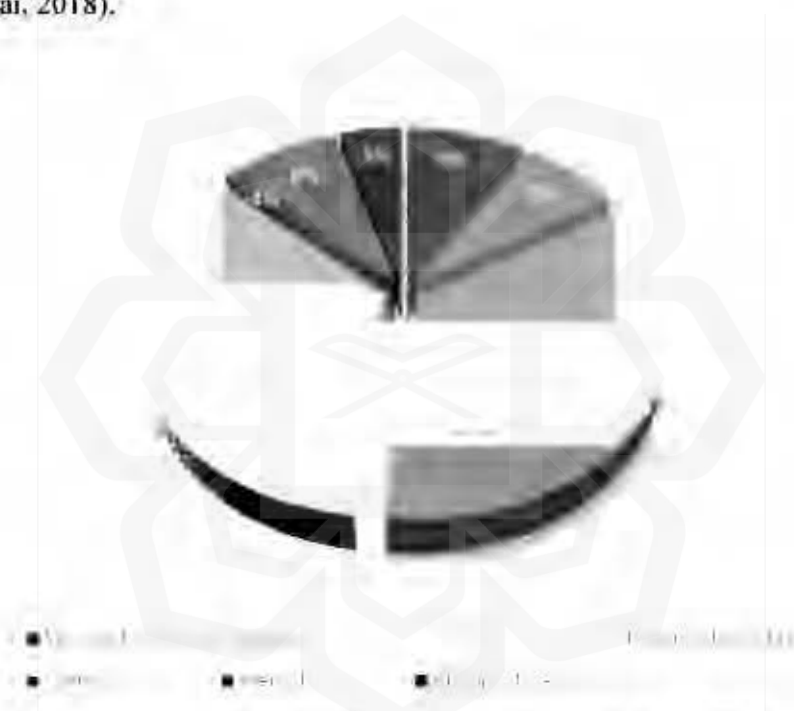


Figure 1.1 Percentage of Registered Persons with Disabilities in Malaysia (Source: Department of Social Welfare Malaysia, 2017)

Based on the figure 1.1 above, the registered Person with Disabilities (PWD) at the Department of Social Welfare, Malaysia in 2017 were 453,258 persons. PWD in physical category recorded the highest number which was 35.2 per cent, followed by learning disability category (34.8%) and visually impaired category (8.9%). Speech category recorded the lowest registration of 0.5 per cent. It is reported by S. Pillai in

The Star (2021) that in Malaysia 10% to 15% of primary school going children are dyslexic. This data shows that the persons with learning disability have quite a large number of total registered person with disabilities which it is enough to call for immediate and early intervention by any means because it is believed that this type of disability is curable. Although there are no specific cure or permanent solution to curb dyslexia, guidance and care as well as extra attention like betterment of education facilities and conducive learning environment is important that may provide huge difference for dyslexic patient namely amongst children (Adnan & Hafiz, 2001 as cited by Alice Sabrina & Nur Syaza (2019). This is important in uplifting the quality of learning process by improving the learning infrastructure for dyslexic student in the Malaysia context towards their betterment in the future.

Many research shows that appropriate instruction and providing suitable learning aid for dyslexia children during learning can help to improve their learning capabilities. Furthermore, a proper set up for their learning environment can assist the children with dyslexia to perform and increase their interest during their learning session. According to Nasir & Efendi, (2017), designing proper learning space and environment will attribute to almost 25% of a student's achievement over their progress in their whole academic year. According to Dyslexia Malaysia Association, (2014), providing an appropriate instruction that aimed towards their learning needs surely can help their literacy difficulties and led them a productive life. This statement shows that an appropriate instruction and providing suitable learning aid for dyslexia children during learning can help to improve their learning capabilities. Furthermore, a proper set up for their learning environment can assist the children with dyslexia to perform and increase their interest during their learning session. The design and maintenance of a child's physical educational setting should support high-quality activities as well as

allow for an optimal use that fosters quality learning. It is through new research in educational settings, new technology, and the consideration of the child in general that can aid designers in creating the most innovative, useful, and effective environment for the world's children to develop, adapt, and learn (Leinonen and Venninen, 2012; Abas et al., 2012). Thus, it is very crucial to understand the children's environment that we have conditioned our future children to adapt to. The design of these facilities, therefore, cannot be understated.

The results of this study are expected to provide a useful insight into providing an appropriate interior design settings for dyslexia learning environment.

1.2 PROBLEM STATEMENT

1. There are a rising numbers of children with Dyslexia and according to Sinnadurai (2018), 5 to 10 percent of the world populations are dyslexic. As stated by UNICEF Malaysia (2014), In Malaysia alone, 1 out of 20 children are dyslexic where 314,000 students have this learning disability. This arising numbers of dyslexic also shows the arising demands for dyslexia learning center. Existing centres are not sufficient to support the large number of this increasing population. In Malaysia, there are 10 Dyslexia Centres operating around the country and its headquarters in Ampang under an NGO body known as Dyslexia Malaysia Association (DMA). This association was set up in 1993. However, the number of centres published still not enough due to increasing numbers of Dyslexic each year. As a result, many children with dyslexia are delayed in receiving their remedial education or extra classes, which are provided by special educators.

2. There is specific learning need and environment need to be considered in order to tackle the children with SLD (specific learning difficulties) especially dyslexia children. Karen (2017) stated that children with dyslexia, dyscalculia, dysgraphia, dyspraxia, attention-deficit/hyperactivity disorder (ADHD) and even autism are all “ostracized” and categorized as slow learners and placed in one class when all of them require different ways of teaching. Many public schools provide facilities and pedagogy system that are not specifically design for dyslexic students but for various disabilities students. According to Hafiz (personal communication, November 15, 2018), Dyslexia children usually have short term memory and lack of confidence, so they need 1 to 1 attention in learning process. So, they require different learning approach and interior learning setting. They should not be placed in the same class with other students with various disabilities.

3. In Malaysia, limited research has been done on providing better learning space design for children with dyslexia. Past literature on dyslexia in Malaysia much focuses on the pedagogy and teaching methods rather than discusses the issue of providing better learning space design that caters to the need of dyslexic children towards their psychological well-being (Alice S.I, 2019). The review of the literature showed that researchers in Malaysia mostly used multisensory and multimedia methods for dyslexia intervention. In Malaysia, most of the treatments are focused on the aspects of language such as word mastery, alphabet identification and writing skills. The cognitive training was carried out to improve specific domain such as visuospatial skills, memory skills and psychomotor skills. (Anis, M.Y, et.al, 2018). Majority of them targeted language components such as identification and mastery of the alphabet as outcomes of the study. According to

Alice S.I (2019), currently, there are only few studies that discusses on the issue of providing better learning space design that caters to the need of dyslexic children in the Malaysian context towards their psychological well-being. All the existing study not comprehensively covering on interior design elements area for dyslexia children learning environment. In fact, there is currently no standardized interior design setting in Malaysian public school or even private center. The designed setting should be practical and applicable to be used by teachers and also user-friendly for all the person accommodating the place to use in facilitating dyslexia children learning needs.

1.3 RESEARCH AIM

To propose an interior design framework on conducive learning space for dyslexic children at the center based on the identified elements from both literatures and direct assessment.

1.4 RESEARCH OBJECTIVE

1. To identify the required interior design elements for Dyslexia learning environment.
2. To investigate the adapted interior elements at the existing learning environment of local dyslexia centers through direct assessment.
3. To formulate an interior design framework for Dyslexia Center based on the identified element from both literature and direct assessment.

1.5 RESEARCH QUESTION

1. What are the interior elements for the interior spaces of Dyslexia Centres?
2. How are the conditions of the existing Dyslexia Centres in relation to interior design elements for dyslexia learning environment?
3. What are the required criteria best to be included in the interior design framework of dyslexic learning environment?

1.6 SIGNIFICANCE OF RESEARCH

Significance of this research is based on the current issues regarding the increasing number of children with dyslexia in Malaysia. This research is vital as education, including education for dyslexia children plays an important role not only concerning individual involved in the kindergarten premise, but also responding to Malaysia's national agenda on education as early from 1957 till present. Kindergarten is known to play this role in providing the most basic and fundamental education system before children step into a more formal education program such as the primary and secondary schools.

Besides that, there is a need in providing an outline study about interior setting for dyslexia learning environment. This issue leads the researcher to cover on this issue and find the solutions by providing an environmental-based design framework for dyslexia learning environment as this research is of benefit not only to policy makers, designers, and educators, but it will also be of importance in promoting better education system in response to Malaysia's national agenda in its quest to produce better nation and brighter future. Another significance of this research is to enrich information regarding dyslexia learning environment by following a systematic framework to produce a conducive learning environment for dyslexia children.

1.7 SCOPE OF STUDY

This research focuses on exploring and understand about dyslexia, symptoms, and its categories. All the study about dyslexia is intended to identify interior design elements for dyslexia learning environment setting to help dyslexia children in their learning process. This research also aims to reduce struggles, capitalize on strengths, and maximize success for people with dyslexia thus enabling them to contribute for their abilities and talents.

1.8 RESEARCH LIMITATION

There are few limitations while conducting this research. The study of this research only focuses on environmental-based or interior elements that need to be installed in dyslexia learning environment. All selected dyslexia center only taken place around Kuala Lumpur and Selangor. Therefore, the outcome of this research may not be applicable for the centre other than those area. The interior elements that will be the focused study for this research only about interior space and learning area arrangement and settings such as furniture arrangement, learning tools arrangement, lighting, materials used for learning environment, colour scheme and windows and openings of the centre. Any setting regarding the teaching and learning syllabus or pedagogies elements for them is not the scope of this research. Thus, the research may be not fully helping the dyslexic as they also need a full setting on how the teaching and learning session will be carried out in order to fully help the dyslexic to overcome their learning difficulties. Lastly, the limitation is about age of the dyslexia student. Focus group for behavior observation only focuses on student from 4 to 7 years old. So, the outcome only will be analysed based on those students age range behavior and only applicable for dyslexia centre for this focused age group.

1.9 THESIS OUTLINE

There are some focuses of study outline throughout this research proposal and it will cover on:

Table 1.1 Structure Thesis Outline

INTRODUCTION	Chapter 1	<p>INTRODUCTION Background of research on how thesis is organized.</p> <ul style="list-style-type: none"> • Background study of children with dyslexia and dyslexia learning environment • Problem statement pertaining to dyslexia children and dyslexia learning environment. • Research aim in carrying out the study • Research objectives of the study • Research questions in relevance to research aim and objectives • Significance of research pertaining the topic study • Scope of study • Research limitation during conducting the research. • Outline of the thesis
ISSUES AND LITERATURE REVIEW	Chapter 2	<p>A REVIEW ON DYSLEXIA SPECTRUM AND INTERIOR DESIGN ELEMENTS OF DYSLEXIA LEARNING ENVIRONMENT Key terms and definition, elaboration and understanding of dyslexia</p> <ul style="list-style-type: none"> • Definition of dyslexia, learning disabilities, specific learning difficulty, special needs education, learning environments and interior design elements • Types and categories of dyslexia • Signs and symptoms of Dyslexia <p>Learning environment for normal children</p> <ul style="list-style-type: none"> • General learning environment • Learning environment for children • Learning environment for special needs children • Learning environment for dyslexia children.

		<p>Interior design elements for dyslexia learning environment.</p> <ul style="list-style-type: none"> • Interior design setting up for learning environment • Interior design setting for dyslexia learning environment • Interior elements and its influence to learning process
RESEARCH METHODOLOGY	Chapter 3	<p>RESEARCH METHODOLOGY AND DESIGN</p> <ul style="list-style-type: none"> • Overview of the research methodology taken • Detail explanation on research design. • Justifications on the method of retrieving, analysing, and synthesizing quantitative and qualitative data. • Site Observation • Interview questions
DATA ANALYSIS AND PRESENTATION OF RESULTS	Chapter 4	<p>FINDINGS OF THE DATA SURVEY AND INTERVIEWS</p> <p>Findings from the interview and site visit at Dyslexia Centres and some schools. Purposes and objectives of the interview, site and behavior observation done on dyslexic and teachers.</p> <p>Analysis and synthesis of collected data.</p> <ul style="list-style-type: none"> • Dyslexia Centre and Classes • Existing interior setting • Interior elements of dyslexic learning environments: <ul style="list-style-type: none"> i. Space planning and facilities provided ii. Lighting and Natural Lighting iii. Windows and Openings iv. Materials and Interior Finishings.
DISCUSSION AND CONCLUSION	Chapter 5	<p>DISCUSSION AND CONCLUSION OF THE RESEARCH</p> <p>Conclusion of the proposal and objective of the research. Then, recommendation for the improvement of current dyslexia centre issues to for future betterment and to achieve the current objectives.</p>