

MULTISENSORY DESIGN ELEMENTS IN STIMULATING LEARNING ENVIRONMENT FOR DYSLEXIC CHILDREN

Nurlelawati Binti Ab. Jalil
Zumahiran Binti Kamarudin
Habibah Binti Ab. Jalil

ABSTRACT

This research aims to investigate multisensory design for stimulating learning environment for children with learning disabilities. Nowadays, there are many learning facilities like Dyslexia centres and schools exist in Malaysia due to increasing pattern of children with the symptoms. Regardless of the situation and arising numbers of existing Dyslexia centres, no standard guidelines to follow for classroom setting of the facilities in establishing the multisensory learning environment for the dyslexic children. Providing the correct support through a proper learning environment setting is very important as the condition is curable. However, an inappropriate corrective method would cause to delay of improvement or worse, affecting their social development which is important for their future. Therefore, understanding multisensory design elements are essential to all Dyslexia centres and schools in creating a stimulating environment for the children. The objectives of this research are to identify and determine the multisensory design elements for the interior spaces of Dyslexia centres and schools. Also, to assess the condition of the existing Dyslexia centres and schools in relation to the multisensory elements in stimulating learning environment for the dyslexic children. Direct non-participant observation was adopted for data collection method while analysis was done based on the availability of multisensory elements in the selected Dyslexia centres and schools. The research found that there are four (4) multisensory design elements that are important for stimulating and engaging learning environment for dyslexic children, which are; visual elements, auditory elements, tactile elements and kinesthetic elements. These integrated learning elements are essential and practical, particularly for dyslexic children. The research also found that most of the visited facilities are not providing sufficient learning standards that stimulate the learning environment for dyslexic students. Most of the facilities did not provide the principle elements of psychology in design which is the most crucial elements of the learning process. Upon the identified multisensory design elements, further and broader scale of research is recommended to establish a design guideline or standard requirements in designing Dyslexia centres and schools in Malaysia.

Keywords: Multisensory design, dyslexic children, learning environment.

INTRODUCTION

In recent years, the numbers of children with Dyslexia are increasing, and according to UNICEF Malaysia (2014), 15% of the total of children population is found to have this learning disability. The cause of the increasing pattern is unknown regardless of many types of research done in the past. Due to the growing trend, more Dyslexia facilities have been made available to help parents educating their children. The facilities offer special learning approach and environment, which is believed as the appropriate corrective method. Generally, the facilities aim to help the dyslexic children to improve their learning disabilities with a small number of students' setting. This small-scale environment is essential due to learning limitation that requires more attention and special treatment compared to normal children. The children with Dyslexia are highly possible to be cured only through institutionalization (Australian Dyslexia Association, 2014). Nowadays in Malaysia, 12 Dyslexia centres are operating under an NGO body known as Persatuan Dyslexia Malaysia (PDM). However, the number of the centre is still low compared to the increasing trend of Dyslexia each year. Besides that, many public schools now have the facilities for students with learning disabilities. The facilities nonetheless are not specifically for dyslexic students and in most cases, the schools are forced to accommodate students with various disabilities such as Autism, Cerebral Palsy, Down Syndrome and much more. According to Suhairi (personal communication, August 11, 2017), and Ruzaini (personal communication, August 7, 2017), dyslexic children require different learning approach and setting, and they should not be placed in the same classrooms of students with various disabilities. Segmentation, in this case, is essential as it will influence their development progress and duration to cure. Studies show that early intervention with the right corrective approach will reduce their emotional struggle and eventually lead to positive adulthood. Without a proper corrective method, it will reduce the opportunity to be progressive in life and indirectly widen their social development gap over time between the children and their peers. Due to this reason, more Dyslexia centres are needed with proper facilities and design consideration for dyslexic children. Therefore, this study aims to investigate multisensory design for stimulating learning environment in the Dyslexia centre with emphasis on children with learning disabilities. The objectives of this research are to identify and determine the multisensory design elements for the interior spaces of the Dyslexia classrooms and to assess the condition of the existing Dyslexia facilities concerning the multisensory aspects in stimulating learning environment for the dyslexic children.

LITERATURE REVIEW

Understanding Dyslexia

Dyslexia is a type of mental disorder that can happen to both children and adolescences. Among the children, it is usually associated with learning disabilities specifically with reading and spelling difficulties disorder (World Federation of Neurology, 1968; Pavey, 2007). According to the World Federation of Neurology, most dyslexic children fail in conventional classroom

experience; fail to attain the language skills of reading, writing; and spelling commensurate with their intellectual abilities. The symptoms condition influences biological condition through affecting their genetic and neurology system; cognitive process through changing the information processing; and behavioral aspect which is the primary characteristic that is detectable from reading and spelling disorder. Therefore, they usually lack in phonemic awareness. Interestingly, there are also researchers identified Dyslexia as a visual impairment in the form of magnocellular-deficit which caused to reversal or overlapping visual effects.

Regardless of the differences in definition, the description indirectly shows a broad spectrum of the dyslexia symptom from one patient to another. Therefore, understanding the spectrums and consideration of pattern of each symptom from a broader perspective in this research is very important, rather than pointing to specific and common approach for its corrective method. It is because with only through institutionalization, the children with dyslexia are highly possible to be cured (Pavey, 2007; Pn.Sariah Amirin, personal communication, April 27, 2017).

Currently, there are abundant of information regarding Dyslexia covering from many areas. However, many of them focused on Dyslexia symptoms (Siti Huzaimah & Aiza, 2012); teaching techniques and understanding of Dyslexia (Gibbs & Elliott, 2010); and individual experiences (Noor Amiera, Akehsan & Syamsul Anwar, 2015). Eventually, little study has been conducted focusing on the physical setting for stimulating environment for dyslexic children. The physical setting or environment for dyslexic children is equally important to the teaching and learning approach as their corrective method because people behavior reflects the interaction of the person itself with their environment (Mead, 1934 & Cronberg, 1975 in Khare & Mullick, 2008).

Types of Dyslexia and Its Symptoms

Generally, according to Shaywitz and Shaywitz (2005), there are various types of Dyslexia or learning difficulties identified based on five (5) theories; phonological theory, rapid auditory processing theory, the visual theory, the cerebellar theory and the magnocellular theory. The primary characteristics are namely; phonological dyslexia, surface Dyslexia, rapid naming deficit, double deficit Dyslexia and visual Dyslexia.

1. Phonological Dyslexia

It is a symptom where the dyslexic children could not understand the sound of language and match them with written symbols; therefore they could not sound out or "decode" words. Most kids with reading issues have some degree of phonological Dyslexia. It is also sometimes referred to as dysphonic dyslexia.

2. Surface Dyslexia

This symptom is also known as visual Dyslexia where the children have difficulty in remembering the whole words by sight. Frequently, they confuse on specific numbers such as '2', '5', '6' with '9', as well as letters such as 'b' with 'd', 'p' with 'q', and much more. They take a longer time to decoding words that keep them from encountering words and often enough to begin to recognize them as a whole.

3. Rapid Naming Deficit

This deficit is linked to processing speed or slow reading. The patient is usually unable to name letters and numbers rapidly when they see them, especially in row manners.

4. Double Deficit Dyslexia

The symptom is referring to children with the deficit in both naming speed and phonemic awareness. Children with this double deficit usually unable isolating sounds and name letters or numbers simultaneously.

Multisensory in Learning Environment

Learning experience could be enhanced when multiple channels (or multisensory elements) are fully utilized. According to Atkinson and Shiffrin (1968), this enhancement would establish permanent memory traces to help improving human learning experiences including the dyslexic children learning experiences. Multisensory also known as VKAT comprises visual, auditory, kinesthetic and tactile as shown in Figure 1 and the key aspects of the VKAT are highlighted in Table 1.

Figure 1: Multisensory elements.

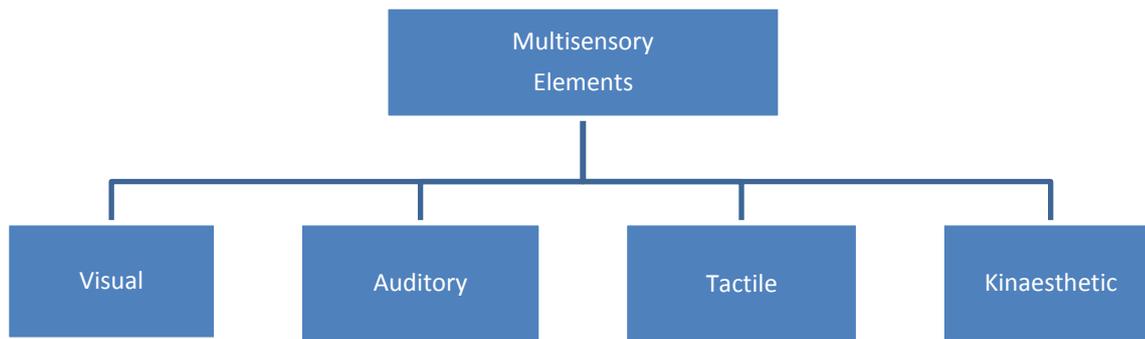


Table 1. Four major multi-sensory elements for learning experiences.

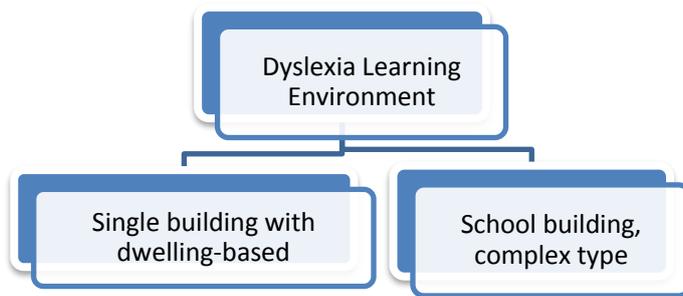
| Stimuli | Key Aspects |
|--------------|---|
| Visual | Use the eyesight to see information, reading, visualization or recording mental images, and memorizing. The element is appropriate to all Dyslexia symptoms for the corrective method. |
| Auditory | It is a learning element technique involves listening and talking through various ways such as rhyming and phonemic. The element is suitable to reinforce new word learning. The element is essential for Phonological Dyslexia and Double Deficit Dyslexia symptoms. |
| Tactile | The elements involve the sense of touch with hands and fingers where engage fine motor skills. The element could treat the person with the symptom of Surface Dyslexia, Rapid Naming Deficit or Double Deficit Dyslexia. |
| Kinaesthetic | It is an element that uses motion and involves both fine and gross motor skills. Therefore, tactile elements usually occur at the same time. In the situation, one is in full awareness the position of each involved muscles and joints as well as the sensation of the movement made. Example of kinesthetic learning elements is such as jumping, running, placing and much more. The element is seen appropriate for the treatment of Surface Dyslexia, Rapid Naming Deficit or Double Deficit Dyslexia symptoms. |

Based on the element criteria in Table 1, not all of the stimuli are applied to all Dyslexia symptoms. For example, auditory is the essential element for a person with Phonological Dyslexia symptom to understand and match the information. The element could help the children to sound out the information accordingly. Conversely, other symptoms require visual and physical approach for them to learn and understand the information. Among the elements, visual is the most powerful and useful corrective element for all Dyslexia symptoms. The inclusion of multisensory in designing a learning environment for dyslexic children is to increase their visual-spaces sensibility for better learning experience. This is because the children construct their knowledge developments by experience as they are exposed to the environment freely. However, in many multisensory types of research, the elements are mostly related to non-physical environmental elements. Due to the shortage, the study focused on it the physicality as it is one of four domains to influence healthy progress in learning development (Abbas et al., 2012).

METHODOLOGY

The study was conducted based on non-participant observation at two (2) selected Dyslexia centres namely; Persatuan Dyslexia Ampang and Dyslexia Genius Titiwangsa Centre in Kuala Lumpur and two (2) public primary schools in Rawang namely; Sekolah Rendah Keb. Taman Desa 2 and Sekolah Rendah Keb. Bandar Tasik Puteri. According to Salkind (2009), the method is where there is no interaction with the person(s) or the observed event. It was adopted with the reason is to be as unobtrusive as possible for minimal data impact. The investigation is focused on primary school students with Dyslexia as the target group due to its highest rate compared to other disabilities in children population (UNICEF Malaysia, 2014). Additionally, the correction method used in all of the facilities and pattern of learning activities can be determined through the observation in its physical setting. There are two types of Dyslexia learning environment selected for observation including a private Dyslexia centre that uses a single floor bungalow, and Dyslexia learning environment that is allocated in public primary school. The purpose of including these two types of environment is to compare the conditions in order to understand their corrective approach and awareness through its physical setting. Additionally, three type of spaces which are the classroom, common area and eating area was observed qualitatively with regards to four multisensory elements; visual, auditory, tactile and kinesthetic.

Figure 2: Types of Dyslexia Learning Environment



RESULTS, FINDINGS, AND DISCUSSION

Multisensory Design Elements for the Interior Spaces of the Dyslexia Learning Environment

The study identified three out of four multisensory elements in the visited places, namely visual, tactile and kinaesthetic elements are commonly available in the inspected area (refer to Table 2). These elements are found on different types of learning environment including classroom, eating area and common area. The visited places were assessed according to four multi-sensory elements as shown in Table 3.

Table 2: Multisensory elements in the visited places

| Elements | Description |
|--------------|---|
| Visual | The presence of colors to create a stimulating environment and improve memorization. Coloured papers decoration, colorful furniture, and illustration from students' paintings and painted wall are material accommodations that serve as visual stimuli and enhance visualization. Visual elements are mostly available in the visited places compared to others as it is the most straightforward elements to produce and obtain. The bright and intense color schemes are mainly used for the furniture and decorations. |
| Tactile | The sensory elements of touch were limitedly explored and only available in teaching materials, not as the interior elements. Although hands, feet, and fingers are primarily among the common body parts that are highly used for the purpose and engage in fine motor skills, interior elements like textured surface and touchable educational materials are not available in all of the spaces. |
| Kinaesthetic | The elements identified are based on its furniture arrangement for any physical learning activities. Apart of that, no exploration of the interior elements was identified. |

Based on the described elements in Table 2, not all of the stimuli are entirely and explicitly explored for the treatment of Dyslexia symptoms. From the visit, auditory elements in the form of multimedia or audio-visual facilities are not available. The tactile and kinaesthetic elements are not sufficiently explored too even though most of the Dyslexia symptoms require both elements as their learning enforcement. Apparently, visual is the only element that has been adapted in various spaces in both types of facilities. It is clear that understanding of Dyslexia symptoms and its proper corrective method from multisensory elements among the facilities providers are not sufficient, as most of the elements do not support the particular requirements for these special children.

Table 3: Summary of assessment on multi-sensory elements for the visited places.

| Site & Space | Multisensory Elements | | | | Score |
|---|-----------------------|-------|---------|--------------|-------|
| | Visual | Audio | Tactile | Kinaesthetic | |
| Classroom: | | | | | |
| 1. Persatuan Dyslexia Ampang | ✓ | | ✓ | ✓ | 3/4 |
| 2. Dyslexia Genius Titiwangsa Centre | | | ✓ | ✓ | 2/4 |
| 3. Sek. Rendah Keb. Taman Desa 2, Rawang | ✓ | | ✓ | ✓ | 3/4 |
| 4. Sek. Rendah Keb. Bandar Tasik Puteri, Rawang | | | ✓ | | 1/4 |
| Common Area | | | | | |
| 1. Persatuan Dyslexia Ampang | ✓ | | ✓ | ✓ | |
| 2. Dyslexia Genius Titiwangsa Centre | | | | ✓ | 1/4 |
| 3. Sek. Rendah Keb. Taman Desa 2, Rawang | | ✓ | | ✓ | 2/4 |
| 4. Sek. Rendah Keb. Bandar Tasik Puteri, Rawang | | | | | 0/4 |

| Eating Area | | | | | | | |
|-------------|--|------|---|------|--|------|-----|
| 1. | Persatuan Dyslexia Ampang | | ✓ | | | ✓ | 2/4 |
| 2. | Dyslexia Genius Titiwangsa Centre | | ✓ | | | ✓ | 2/4 |
| 3. | Sek. Rendah Keb. Taman Desa 2, Rawang | N. A | | N. A | | N. A | |
| 4. | Sek. Rendah Keb. Bandar Tasik Puteri, Rawang | N. A | | N. A | | N. A | |



Figure 3: Classroom at Persatuan Dyslexia Ampang, Kuala Lumpur.

Condition Assessment of the existing Dyslexia Learning Environment

From the observation, it was apparent that color is the primary visual elements used at the places to create a stimulating environment. This element is found in the form of colored paper as wall decoration, colorful furniture, and illustration from students' paintings and painted wall. However, not all facilities integrate the visual elements in the classrooms. This includes classes in both types of Dyslexia facilities. The tactile element provided in the classrooms is not well explored too. The element is detected from students' workplaces in the form of learning materials and as decoration in some areas as shown in Figure 3 and Figure 6. Kinaesthetic elements were identified at the places are of the arrangement of the furniture and the layout that would influence physical movement. Meanwhile, auditory was not available at most of the selected areas. This is probably because the element requires appropriate facilities such as an audio-visual aid which is usually stored in a different room.



Figure 4: Cabin classroom at Persatuan Dyslexia Ampang 1, Kuala Lumpur.

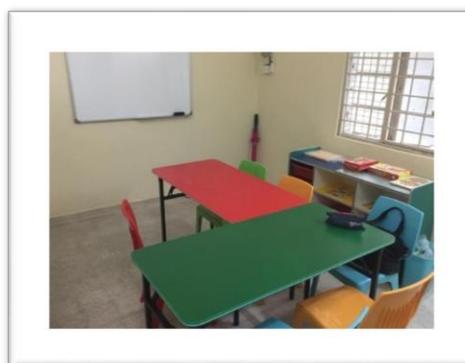


Figure 5: Classroom at Dyslexia Genius Titiwangsa Centre, Kuala Lumpur.

The study suggests that most of the Dyslexia facilities did not consider having the multisensory elements in various means for their interior as part of improving the learning environment. At the center, the spaces use limited approach even though it was clear that some of the areas integrate two or more elements. The same situation happens in the schools with a bias to visual elements and less exploration to others. Most of the learning environments only have spaces that integrated three out of four elements. These include visual, tactile and kinaesthetic elements which are found in most classrooms at the Primary School 1 in Rawang as shown in Figure 6. The presence of colors in the visited classrooms gives visual stimuli, but apparently, not all classes use the same approach and color scheme as evident in the classroom at Primary School 2 in Rawang (Figure 7).



Figure 6: Classroom at Sek. Ren. Keb. Taman Desa 2, Rawang.



Figure 7: Classroom at Sek. Ren. Keb. Bandar Tasik Puteri, Rawang.

It was found that common rooms and eating areas are furnished with two or less multisensory elements including tactile and kinesthetic elements. It showed the areas at the primary school are not equipped with the multisensory elements which indicated underutilize issue. The analysis also showed that audio element was not found at any of the places. This can be seen from the score of the checklist, where none of the spaces included the element. Therefore, both types of Dyslexia learning environments are yet to optimally integrating the elements in the physical setting. They are focusing merely on the teaching content instead of looking at the environment as part of learning and teaching aid for the children. When it comes to personal view among the educators at the facilities, a majority of them did not emphasize the environmental development aspect as part of their approach to assist the learning process. This is consistent with the scores from Table 2 regarding spaces utilization and multisensory integration.



Figure 8: Common area at Persatuan Dyslexia Ampang, Kuala Lumpur.



Figure 9: Common area at Sek. Ren. Keb. Taman Desa 2, Rawang.



Figure 10: Common area at Dyslexia Genius Titiwangsa Centre, Kuala Lumpur.

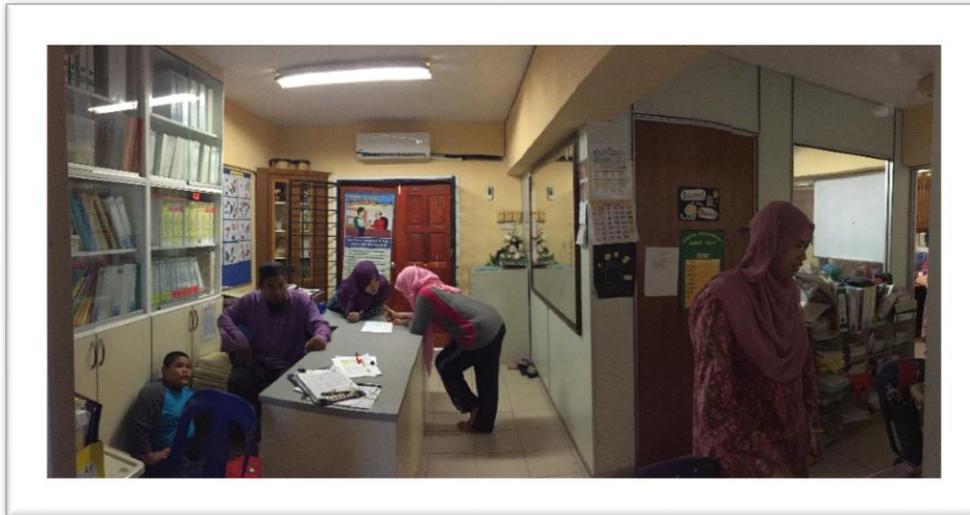


Figure 11: Common area at Sek. Ren. Keb. Bandar Tasik Puteri, Rawang.



Figure 12: Eating area at Dyslexia Genius Titiwangsa Centre, Kuala Lumpur.



Figure 13: Eating area at Persatuan Dyslexia Ampang, Kuala Lumpur.

In summary, based on the objective of the study, three out of four multisensory elements were identified in the visited areas with each of them is inconsistently explored. Consequently, from the findings and discussion, there is a need for special education classrooms that seek accommodations that foster the learning and management of a class of Dyslexia learners. Although apparently, three (3) elements are available in the visited places, each of the available elements is not fully explored according to the Dyslexia symptoms. Due to the limitation, the multisensory elements are not effective in making the places attractive and stimulating as it should. The physical impression in the learning environment can be an ally or enemy to the learning process; its arrangement can contribute to control, the learning, the relationship and the pleasure of learning together (Siti Huzaimah & Aiza,

2012; Mok Soon Sang, 2012). It is because the physical impression and its arrangements in the learning environment are the first things to see that psychologically can stimulate the learning process. Interior elements such as color, texture, different of forms, values and much more play an important role in design to define the space and could be part of the corrective approach in the facilities. Moreover, many studies have highlighted the impact of the learning environment to students' performance and well-being. For example, a study upon children's classroom environment setting by Abbas et al. (2012) has postulated that well-defined learning environment contributed to positive learning behavior. In another example, Nurlelawati et al. (2016) highlighted that white color which is seen in many of learning areas, are found to give salient impact such Dysphoria (anxiety) and decrease of performance especially for a longer duration of exposure. Therefore, a well-designed environment with proper color scheme should be used to avoid any adverse impact or to improve the student's well-being. This demonstrates that more explorative studies on developing Dyslexia facilities in Malaysia related built environment should be rigorously conducted for many possibilities and implemented in the building requirements specifically for the Dyslexia facilities. According to Sariah Amirin, the founder of Persatuan Dyslexia Malaysia (personal communication, 2017) emphasized that Dyslexia centers are the place where the children were developed and nurtured to become knowledgeable, caring, healthy, dynamic and emotionally stable.

CONCLUSION AND RECOMMENDATION

In conclusion, the findings of the study suggested that most of the Dyslexia facilities including public primary schools not consider having the multisensory elements in various means for their interior as part of improving the learning environment. As such, proper accommodations and modification need to be provided to their learning environment with the multisensory elements are fully utilized, and learning experience is enhanced efficiently. If studies confirmed that 50% of Dyslexia resulted from genetic factor, hence there is a good chance of potential impact for the learning environment to improve the condition. Learners with Dyslexia can be corrected their learning ability and develop their skills by tailoring the resources to their need. For these reasons, they need an environment that can control their behavior and at the same time to focus on their learning. Most people with this impairment can overcome their literacy difficulties and lead productive lives if they received appropriate instruction and supported physically and emotionally. If this was the case, Malaysia envisions to produce quality human capital through quality education as stated in TN50 (National Transformation 2050), could be achieved.

In person-behaviour environment, the design of the environment should be suitable for the functional requirements for the users. For dyslexic children, every turn at their surroundings is important stimulation agents contributing to their positive growths and appropriate for the corrective method. Although this research has found that every space should not necessarily to include all of four multisensory elements, it was clear that the stimulating elements should be accessed through architectural or design perspective for optimum exploration and appropriate application. There is a possibility that not all multisensory elements are significant to the children depending on the context and function of the place. Too much stimulation could cause to withdrawal or undermine behavior as it is too much for them to bear due to different screening abilities of every individual (Nurlelawati et al., 2016). Therefore, embedding the multisensory elements should be context based and with full consideration of their spectrums. It appears that currently, it is difficult to form a clear conclusion from investigations of multisensory elements as the most appropriate design elements for Dyslexia facilities. This research emphasizes the importance of further investigation that overcomes the limitations of the current research approach such as to reflects a bigger scale of observation facilities and may provide consistent findings. The research is of benefit for future research to formulate a design guideline for Dyslexia facilities improvement or new set up. Additionally, the research could be a good reference point for the designer, Persatuan Dyslexia Malaysia (PDM) or other private Dyslexia centres as well as associations and the building policymakers. Above all, the findings are significant in promoting better education system to produce better nation and brighter future as in the TN50 aspirations.

ACKNOWLEDGMENTS

The authors would like to thank the Dyslexia Centres and two primary schools which involved in the research, for their valuable information and support. They are Persatuan Dyslexia Ampang, Kuala Lumpur, Dyslexia Genius Titiwangsa Centre, Kuala Lumpur, Sekolah Rendah Keb. Taman Desa 2 in Rawang and Sekolah Rendah Keb. Bandar Tasik Puteri, Rawang.

REFERENCES

- Abbas, M. Y., Othman, M., & Rahman, P. Z. M. A. (2012). Pre-School Classroom Environment: Significant upon Childrens' Play Behaviour? *Procedia-Social and Behavioral Sciences, (ajE-Bs)* 49-65.
- Atkinson, R. C., & Shiffrin, R. M. (1968). Human Memory: A Proposed System and its Control Processes. *Psychology of learning and motivation, 2*, 89-195.
- Australian Dyslexia Association (2017). Retrieved July 12, 2017, from <http://dyslexiaassociation.org.au/how-is-dyslexia-evaluated>.
- Gibbs, S., & Elliott, J. (2010). Dyslexia: A categorical Falsehood Without Validity or Utility. In *Literacy and Learning* (pp. 287-301). Emerald Group Publishing Limited.
- Jalil, N. A., Yunus, R., Said, N. S., & Iqbal, M. I. (2016). Colour Effect on Physiology in a Stimulating Environment. *Pertanika Journal of Social Sciences & Humanities, 24*(2).
- Khare, R., & Mullick, A. (2008). Educational Spaces for Children with Autism; Design Development Process". *Environments, 15*, 16.
- Malaysian Dyslexia Association (n.d). Retrieved April 27, 2017, from <http://dyslexiamalaysia.org.my/background/>
- Mercer, C. (2002). Accommodating Students with Dyslexia in all Classroom Settings. Fact

- Sheet #51.International Dyslexia Association. Retrieved from
http://www.interdys.org/ewebeditpro5/upload/Accommodating_Students_with_Dyslexia_In_All_Classroom_Settings.pdf
- Mok, S. S. (2012). *Educational Psychology & Pedagogy: Learner and Learning Environment*. Penerbitan Multimedia.
- Noor Amiera, A., Akehsan, D. & Syamsul Anwar, S. I. (2015). Enduring Difficulties: The Challenges of Mothers in Raising Children with Dyslexia, *Procedia - Social and Behavioral Sciences*, Volume 202, 2015, Pages 107-114, ISSN 1877-0428, <http://dx.doi.org/10.1016/j.sbspro.2015.08.213>.
- Pavey, B. (2007). *The dyslexia-friendly primary school: a practical guide for teachers*. SAGE.
- Salkind, N. J. (2009). *Exploring research*, 7th ed. N.J: Pearson Prentice Hall
- Shaywitz, S. E., & Shaywitz, B. A. (2005). Dyslexia (specific reading disability). *Biological Psychiatry*, 57(11), 1301-1309.
- Siti Huzaiman, S., & Aiza, J. (2012). Improvising Reading Classes and Classroom Environment for Children with Reading Difficulties and Dyslexia Symptoms. *Procedia-Social and Behavioral Sciences*, 38, 100-107.
- Stokols, Daniel, and Irwin Altman, eds. *Handbook of Environmental Psychology*. Vol. 2. Wiley, 1987.
- UNICEF Malaysia. Retrieved July 12, 2017, from https://www.unicef.org/malaysia/UNICEF-Children_with_Disability_in_Malaysia_2014_lowres.pdf

Nurlelawati Binti Ab. Jalil
Kulliyah of Architecture and Environmental Design
International Islamic University Malaysia, 50728 Kuala Lumpur, Malaysia
Email: nurlelawati@iium.edu.my

Zumahiran Binti Kamarudin
Kulliyah of Architecture and Environmental Design
International Islamic University Malaysia, 50728 Kuala Lumpur, Malaysia
Email: zumahiran@iium.edu.my

Habibah Binti Ab. Jalil
Faculty of Educational Studies
Universiti Putra Malaysia, 43400 Serdang, Selangor, Malaysia
Email: habibahjalil@upm.edu.my