

Assessment Criteria to Identify the Children's Learning Ability in Writing Skills: An Empirical Study

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ABSTRACT

Early screening of dyslexia is becoming a necessity. The diagnosis of dyslexia is often determined when children begin to exhibit academic difficulties in school. Guardians usually referred them to a pediatric to assess their level of learning ability according to their age. With a special treatment, children can be diagnosed. The pediatricians usually will spend several sessions with a child by conducting an initial assessment and guardians may receive recommendations for treatment and guidance for educational planning. It may be costly. Therefore, a study has been done to see the availability and accessibility tools in society to diagnose children's learning ability. Finding shows that the available assessment tests mostly discovered only the cognitive level in children's learning. Diagnostic assessment should encompass all the three components together which is cognitive, affective and psychomotor. This research is intentionally to fulfill the requirement above. An empirical study has been conducted in order to identify the learning capability for pre-school children by determining the range of score for the assessment test. Two research questions has been raised for this research on how to determine the range of scores in order to identify the capability of children's learning test. A criterion based on the assessment score has been produced and validated by the child psychologist.

KEYWORDS: Learning Disability, Assessment, Writing Skills, Screening Test.

INTRODUCTION

Dyslexia is one of the most common learning disability and it was reported that 5 to 10 percent of school children having dyslexia in Malaysia [1]. This kind of disability commonly affects a person's ability in the areas of reading, writing and spelling. Children with dyslexia often require extra help in school as they having difficulties to learn fast as those who do not have learning disabilities. Despite having learning problems, the children also have problematic in emotion and behaviour. The children not only have the hard time to structure their thoughts, but also have trouble to express themselves clearly during conservation. Due to this problem, early detection or diagnosis to children with learning disability is extremely important in order to find a better intervention in their learning activities.

Early detection can result in more effective educational planning. The sooner dyslexia is detected, the better, so that the child can start receiving the educational help he or she needs. Hence, early detection is capable of looking after children with special needs in education. Parents can learn early on how to help their children improve learning ability and social skills throughout the developmental stages with assistance from specialist. Thus, the occurrence of future problem in children's learning, emotion and behavior can be reduced. Early detection of dyslexia is becoming a necessity [2]. In dealing with such situation, guardians usually referred them to a pediatric to assess their level of learning ability according to their age to diagnose. The pediatrician usually will spend several hours with a child to conduct an initial assessment and guardians may receive recommendations for treatment and guidance in educational planning. However, it may be costly to certain people. A study has been done on the available and accessible tools on web about screening children's learning ability. The finding shows that the diagnosis tests that have been conducted mostly discovered only the cognitive level in children's learning, but not for affective and psychomotor tests. Basically learning domain should encompass three main components which are cognitive, affective and psychomotor. However, the finding from the preliminary work, there are several components missing in the existing assessment tools.

Problem Statement

Basically, guardians can do their own diagnosis at home with their children at early stage besides having the medical treatment which require a lot of cost for the consultation fee and treatment. Children can be trained as early as possible in order to engage them with a basic lesson in their learning. However, not all guardian knows on how to diagnose their children or aware about this matter. Based on the several case studies, it shows that the assessment tests that have been conducted (via online) mostly discovered only the cognitive

level in children's learning. According to [3], diagnostic assessment should encompass all the three components together which is cognitive, affective and psychomotor because parents are totally concerned about their children's intellectual, attitudinal and physical characteristics.

METHODOLOGY

The research methodology has been divided into 4 stages. The stages consist of requirement for learning, sampling and data collection, data analysis and findings.

a) Requirement for learning

In this phase, a preliminary study through journals and articles has been done in order to understand characteristics of the disability children in learning in general. There are two important components that will be considered in the study;

- Respondent and their characteristics: The target respondent for this research is pre-school children which are between 4 to 6 years.
- Type of learning domains: The learning should encompass all the three domains of learning skills which are cognitive, affective and psychomotor [3].

b) Sampling and data collection

The design survey for this research is identified based on the learning alphabet syllabus of preschool children over three domain of learning. The design survey is described in Table 1. The survey is conducted based on one-to-one approach between researcher and the respondent. An activity room has been used to run the survey and the children worked individually for each task. The children were asked to write the alphabet and the situation is been observed. After completing the survey, statistical analysis is carried out to analyze the children's performance.

Table 1: Design survey over three domain of learning skill

Skill Domain	Construct	Required Skills
Cognitive	Shape of letters	Starting a form of letter
		Forming the number of lines in each letter
Affective	Instruction	Writing capital letters and lower case letters
		Understand the instruction
		Confidence with instruction
		Response to instruction
Psychomotor	Holding writing instruments	Holding a pencil in the right way
	Movement of writing	Movement of forming letters
		Connecting the form of letters

c) Data Analysis

The results of data analysis are based on the assessment test that was conducted with two groups of children which are normal and dyslexic. Both groups of dyslexic and normal children were observed using the same set of questionnaires. The questions are classified into three parts of learning domain namely cognitive, affective and psychomotor level. For each parts of learning domain, the questions are categorized into three skills. The children are evaluated based on their performance ability. The children are classified as good if they know and able to do with their own correctly. Meanwhile the children are classified as average if they know and able to do with assistance. The children are classified as below average if they know some basic things but unable to do with their own and always in need of guidance.

d) Findings

The score for each child will be calculated based on cognitive, affective and psychomotor skill. For each skill that a child able to perform correctly with their own, two marks will be counted. Meanwhile one mark will be counted if a child able to perform with assistance and zero mark for a child who unable to perform neither individually nor with assistance. After the completion of observation, the total score will be counted for each child. The range of score is taken into account for all ages for both groups of children. Lastly, the range of scores will be determined as an indicator for dyslexic assessment tool. If the total score is below than benchmark score, the special attention is needed for a child. Otherwise, the child is labeled as normal. Those criteria are validated by the child psychologist.

DATA ANALYSIS AND FINDINGS

The results of the data analysis are based on the test that was conducted with two groups of children which are normal and dyslexic. The test for the normal group was conducted in two selected preschools which known as Tadika Mutiara Bistari, Shah Alam and Taski Abim Ibnu Sina, Putrajaya among children aged from 4 to 6 years old. There were 90 children from normal group involved in this test. The test was also conducted at Dyslexia Association of Malaysia, which in involved another 10 dyslexic children aged 6 to 10 years old. According to [4] (as the headmaster of Tadika Mutiara Bistari), the children below 66 months old can never be labeled as dyslexic. [5] also added that a child can be professionally diagnosed with dyslexia as early as 5½ years old. The total respondents for this survey are 100 in which 49 of them are females and 51 of them are males.

The children's ability performance has been analyzed through observation method. Both groups were observed using the same questionnaires which consists of three levels in learning domain and some points will be given according on their performance. The level of performance is classify as G, A and BA, where G is indicating for good performance (without assistance) with 2 points, A is indicating for average performance (with assistance) with 1 points and BA is indicating for below average performance (neither individually nor with assistance) with zero point.

The comparison of total score of cognitive, affective and psychomotor levels for normal and dyslexic group based on average is shown in Figure 1. Both groups were observed during writing the alphabets and marks are given based on their performance. The highest score for each of the learning domain is 6 marks while the lowest score is 0. For the normal group of age 4 years old, majority of the children scored 15 marks out of 18 total marks. Meanwhile, majority of the children of age of 5 years old obtain 17 marks out of 18 marks of total score. In the meantime, majority of 6 years old children scored full marks for every cognitive, affective and psychomotor level.

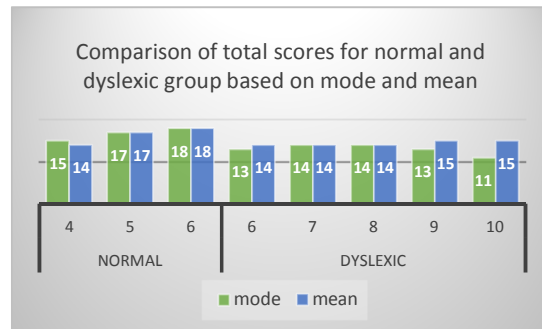


Figure 1: Comparison of total scores for normal and dyslexic children based on average

Figure 2 shows the total scores for 4 years old children with the highest score for the test is 15 points, which is obtained by 16 children while the lowest score is 3 points which is obtained by a child. Based on Figure 3, all the children have obtained their points greater than 13 while Figure 4 also presented the performance of the all children able to obtained full point (18 points) but only one child who only obtained 13 points.

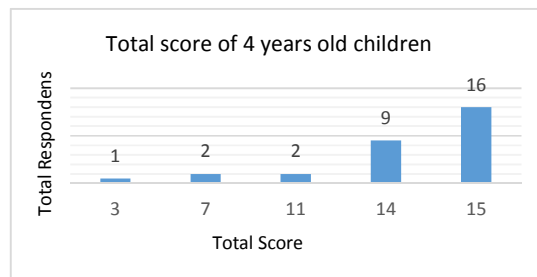


Figure 2: Total score of 4 years old children

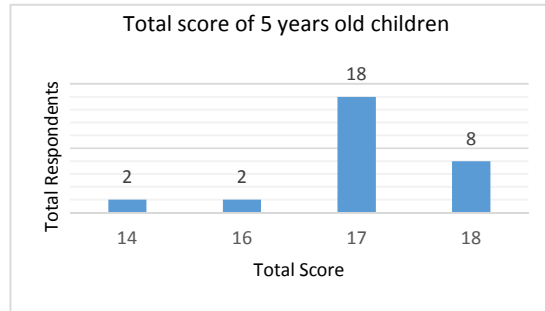


Figure 3: Total score of 5 years old children

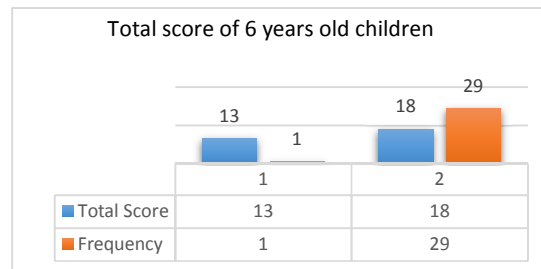


Figure. 4: Total score of 6 years old children

At the age of 6 years old, they should be able to have all the skills in learning at a minimum capability. From the test, 6 years old children from the normal group should obtain a score 18 marks out of 18 of the total score. However, during the observation the researcher found out that one out of 30 children from the normal group has difficulties in learning the alphabets, not only in terms of cognitive but also affective and psychomotor domains. This child has the same level of learning capabilities as 6 years old dyslexic children who score 13 to 14 out of the total score of 18 in the same test.

The total score from dyslexic group is shown in Figure 5. There are 2 children with the highest point (which is 18) while the lowest score is 11 points. The performance from that group is getting better and they will be able to adapt the mainstream education as early as possible.

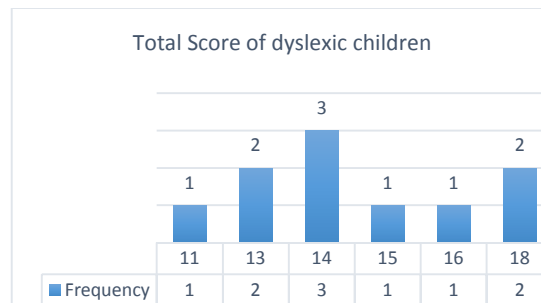


Figure 5: Total score of dyslexic children

RECOMMENDATION

From the analysis of the questionnaire, those data is used to determine the children's performance and an assessment criterion has been formulated. These criteria can be used in diagnostic tool what will be developed later in future. Table 2 below shows the recommended of assessment criteria to identify the children's learning ability. The benchmark score for a normal child of 4 years old should obtain 3 marks and above for cognitive, 6 marks for affective and 5 marks for psychomotor level. Therefore, the total score for a minimal assessment should be 14 out of 18. If the children score is less than 14, it indicates that the children need a special attention. The same description is also given to the age of 5 and 6 years old. Parents should aware of their children's performance and give them special attention to their education.

Table 1: Assessment criteria to identify the children's learning ability

Age	Score Range for Normal Child Group	Indicator/Interpretation of Total Score	
4	Cognitive: 3 out of 6 Affective: 6 out of 6 Psychomotor: 5 out of 6	14-18 (Normal)	<14 (The children need special attention)
5	Cognitive: 5 out of 6 Affective: 6 out of 6 Psychomotor: 6 out of 6	17-18 (Normal)	<17 (The children need special attention)
6	Cognitive: 6 out of 6 Affective: 6 out of 6 Psychomotor: 6 out of 6	18 (Normal)	<18 (The children need special attention)

CONCLUSION

This research was attempted to study an accessible method to identify children's learning ability. It started with studying the requirement of preschool children which is then follow by conducting the survey through an observation of writing the alphabet. The analyzed data gathered was then reported into finding which is proposing the benchmark score for a normal child based on age. The research was done according to the research methodology where the activities conducted involved of four phases which are requirement for learning, sampling and data collection, data analysis, and report the finding. By considering the assessment test in determining the benchmark score for dyslexic tool, hopefully bring a better solution for guardians to diagnose children at early stage rather than bring the children to psychology expert or pediatric. Even though the assessment test only covered the very basic syllabus which is writing the alphabet skills, the researcher believes that the assessment test able to discover thoroughly children's ability in learning which is not only involved the cognitive components but also affective and psychomotor components.

ACKNOWLEDGEMENT

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REFERENCES

1. Lee, L. W. 2008. Development and Validation of a Reading-Related Assessment Battery in Malay for the Purpose of Dyslexia Assessment. *Annals of Dyslexia*, 58(1): 37-57.
2. Snowling, M. J. 2013. Early Identification and Interventions for Dyslexia: A Contemporary View. *Journal of Research in Special Educational Needs*, 13(1): 7-14.
3. Peter, W. and R. Michael. 2008. *Classroom Assessment: Concepts and Applications*. McGraw-Hill Global Education Publishers.
4. Muliani. 2015. Personal Communication, October 27, 2016.
5. Susan, B. 2014. Bright Solutions for Dyslexia. Retrieved from URL <http://www.dys-add.com/getHelp.html>

Appendices

For the preliminary work, three case studies have been selected in order to review the parameter used in assessment tool to diagnose children in learning. The summary from the finding is presented in Table A. The table shows the assessment tests that have been conducted to the children in the first case study (labelled as Case Study A) involved the cognitive and affective domain. Meanwhile in case study two and three (labelled as Case Study B and C), both are involved the cognitive domain. Therefore, the existing module for the assessment tests can be improvised so that all the components in learning domain can be considered.

Table A: Findings from Case Studies over Domains of Learning

Domains of Learning	Assessment Tests	Case Study 1	Case Study 2	Case Study 3
Cognitive	Remembering	✓	✓	✓
	Understanding	✓	✓	✓
	Applying	✓	✓	✓
	Analyzing	✓	✓	✓
	Evaluating	✓	✓	✓
	Creating	✓	✓	✓
Affective	Receiving	✓	x	x
	Responding	✓	x	x
	Valuing	x	x	x
	Organization	x	x	x
	Characterization	x	x	x
Psychomotor	Reflex Movements	x	x	x
	Fundamental Movements	x	x	x
	Perceptual Abilities	x	x	x
	Physical Abilities	x	x	x
	Skilled Movements	x	x	x
	Nondiscursive Communication	x	x	x

Notes:

¹ J. David and K. Balakrishnan. 2014. Learning Disability Prediction Tool Using ANN and ANFIS. Soft Computing, 18(6): 1093-1112.

² A. Loizou and Y. Laouris. 2011. Developing Prognosis Tools to Identify Learning Difficulties in Children Using Machine Learning Technologies. Cognitive Computation, 3(3): 490-500.

³ P. Manghirmalani, Z. Panthaky and K. Jain. 2011. Learning Disability Diagnosis and Classification. A Soft Computing Approach. Information and Communication Technologies, 479-484.