

U.S. Law for Americans with Disabilities Act PL 94-142 or the IDEA (Hadadian, 1996). Although most western countries currently have such laws that require psycho-educational testing to document learning disabilities, theorists today are still raging in controversy about whether or not intelligence testing is the true answer to solve educational problems. Many feel that a more ecological based assessment is more fair and more comprehensive and with some "diagnostic" assessment of abilities and weaknesses, a more appropriate remedial educational plan would benefit students most. That is where the field of intelligence testing is at today -still challenging the schema of intelligence and the schema of testing!

### Chapter three - Methodology

#### Selection of the school and students of the study

Through the assistance of committee members in the Specific Learning Disabilities Association (SLDA), the Sekolah Kebangsaan Taman Kooperasi Polis (SKTKP) was chosen as a school that was interested in learning more about dyslexia. Last year, the SLDA held workshops for parents and teachers at the school which would lead up to this research project as a case study of the standard two class to determine the causes of reading difficulties among its students. From early in the project, it had the full cooperation and support by the Head Mistress and the Parent Teacher Association. Her cooperation received throughout the project was immensely important. In order to gain official entry, applications were made through the Planning and Administration Unit of the Ministry of Education. In addition, as a resident foreigner in the country a

research pass also had to be obtained from the Economic Planning Unit of the Prime Minister's Department. Both applications took several months, but were approved.

The standard two class of SKTKP consists of 255 students in 6 classes. Each class has from 36-45 students in it. The children are of Malay and Indian ethnicity only - no Chinese students are enrolled in this grade. Not all children were present on the day of the screening test, so the final screening test sample was 230 students, as shown in Figure 1. As this is a case study and the testing instruments were developed by the researcher and are still in developmental stages, a full reliability analysis on a proper representative sample should be conducted in a future research project.

<u>N = 255</u>	<u>Total</u>	<u>Valid</u>	<u>Valid Percent</u>
Malay	245	220	86.28
Indian	10	10	3.92
Missing		25	9.80
<u>Total</u>	<u>255</u>	<u>255</u>	<u>100%</u>

Figure 1. The USBBM sample

#### Description of the testing instruments

##### Ujian Saringan Bacaan Bahasa Malaysia (USBBM)

Preparation for the assessment of children with reading disability or dyslexia in SK Taman Kooperasi Polis was done in three stages with two reading

tests and further mental ability testing and ecological assessment. The first stage, in preparation for the research project, was a field test of the USBBM in Sekolah Kebangsaan Damansara Jaya with two standard two classes, one that had low to average readers in it and one that had average to superior readers in it. This was recently constructed by the author and a field test was necessary to determine its reliability and content and construct validity. Refer to Appendices A, B and C for the instructions for teachers, a copy of this instrument and the score summary.

This test was divided into two parts, the first being an oral test of decoding skills and comprehension skills, the second part being a silent reading test. The second part covers vowels, consonants, syllables and word recognition. A final two sections on silent reading comprehension are also included. Figure 2 describes the various essential areas of reading skills being measured in each section of the test which illustrate its construct validity. It is given in Bahasa Malaysia as the test was necessarily constructed in the language. A translation of terms is given in Appendix D for reference.

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**Bahagian satu - ujian lisan**

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1. Ujian kefahaman lisan
  2. Ujian ejaan lisan
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**Bahagian dua - ujian menulisan/senyap**

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3. Ejaan dan kefahaman secara ujian menulisan
4. Dekoding
  - A. Konsonan (K) & vokal (V) -konsonan awal diberi
  - B. Konsonan & vokal
  - C. Vokal awal
  - D. Konsonan
  - E. Suku kata
5. Kenalan perkataan
  - F. Kenalan perkataan/konsonan awal diberi

- G. Berbezaan konsonan awal
- H. Kenalan konsep nombor
- I. Sambungan suku kata kv + kv , kv + kvk
- J. Sambungan suku kata kvk + kvk, kvk + kv

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**Bahagian tiga - Kefahaman bacaan**

- 6. A. Soalan kefahaman
- B. Soalan kefahaman

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Key : K = Consonant V = vowel

Figure 2. Skills tested in the USBBM (in Bahasa Malaysia)

Teacher feedback also helped to verify the content validity as well as the use of several standard one and standard two text books. The second stage was the actual USBBM testing in the case study school.

Ujian Diagnostik Bacaan Bahasa Malaysia and mental ability testing

The third stage was the administration of the "Ujian Diagnostik Bacaan Bahasa Malaysia" (UDBBM) together with the Raven's Colored Progressive Matrices (CPM) targeted only at those students who have been screened out from the USBBM as having low reading ability. The Raven's Colored Progressive Matrices is a culture fair standardized test of mental abilities published by the Oxford Psychologists Press. Norms are available from several different countries so that a comparison to the performance of the case study group can be made. Various reliability studies have been done on the Raven's CPM using both the test-retest method and the split-half reliability methods with reliability values ranging from .82 to .95.

The UDBBM is a completely oral reading test that is diagnostic in nature and consists of reading "suku kata", (K=Konsonan or consonant/V=Vokal or vowel) KV + KV words, KVK + KVK words, KVKK + KV words, + KKV,

“nonsense words”, reading of sentences and short paragraphs for fluency in reading and comprehension. “Nonsense words” are a part of many reading tests as it assesses if a child truly knows their syllables or not and prior knowledge of basic sight words can not be used to pronounce the words. It’s format was partially based on other internationally recognized tests of reading ability, such as the Neale Analysis of Reading and the TORC - Test of Reading Comprehension. Each of the sections is progressively more difficult in word length and structure.

Kenal huruf	Kenal suku kata	Kefahaman
huruf abjad	sambung suku kata KV+KV	Taxonomy Bloom:
huruf sambung	sambung suku kata KVK+KVK	kenal ide pokok
huruf vokal	suku kata KV	kenal turutan cerita
huruf konsonan	suku kata KVK	kenal butiran
huruf tak tentu	imbuhan awal	
huruf akhir	imbuhan akhir	
huruf awal kefahaman		

Figure 3. Skills tested in the UDBBM

Details of the areas of oral reading skills measured to illustrate it’s construct validity are provided in Figure 3, which is also in Bahasa Malaysia, the language of the test. It is a graded test for standards one and two, so that a competent standard two reader should be able to complete the test. (Refer to Appendices E, F and G for a copy of this instrument, the score summary and reporting record.)

This test was developed last year and a pilot study was conducted in March 1998 on a sample of 10 students each from two schools. It was administered to a

representative and stratified sample of students with low, medium and high reading ability. After the test, an item analysis was conducted and most items fell within a .40 - .80 reliability level. The test remained fairly the same with only a few minor item changes. The Spearman rho correlation was run on split halves of the 216 item test with the results as follows :

Table 1. Spearman's rho (Split -test reliability) on the UDDBM

		Half 1	Half 2
Correlation coefficient	Half 1	1.000	.417
	Half 2	.417	1.000
Significance (1-tailed)		.	.000
		.000	.
N		108	108
		108	108

With this correlation coefficient, a correction formula, the Spearman-Brown prophecy formula, was then be applied to estimate the internal consistency of the test.

$$r = \frac{2r}{1+r} = \frac{2(.417)}{1+.417} = \frac{.834}{1.417} = .5885$$

Figure 4. Reliability level of the UDDBM

Typically, a test should have a .80 or higher reliability level. However, when new tests are in early developmental stages, the reliability level is not expected to always achieve this level. A reliability level in this instance of .5885

is acceptable for a first time diagnostic test. Further research is needed to improve the test and continue validation and reliability studies.

Teacher 's views were also sought and their comments were taken into consideration as well in order to help with the content validity. Concurrent validity was checked by running the Pearson's bivariate correlation of the scores with the students actual academic performance in Bahasa Malaysia. Adjustments and item corrections were undertaken before the test was used for this research project.

#### Qualitative data study

Finally, the students who were suspected of dyslexia based on the Raven's CPM and the UDDBM were subject to a further qualitative study. Their academic performance records from Standard one were obtained from the school (Appendix H). Family histories (Appendix I) were obtained from a personal data or "kajian peribadi" form. A behavior checklist completed by the teacher was also obtained (Appendix J), in order to gain a better understanding of their difficulties.

#### Administration of the screening and assessment program

##### Stage one

Development and validation of the screening for reading test in Bahasa Malaysia (USBBM) included several steps. After development of the test, it was shared with remedial teachers in the Unit Pendidikan Khas of the Ministry of Education (MOE). I sought their advice and recommendations for changes. Next, the test was modified according to recommendations and taken to a school,

Sekolah Kebangsaan Damansara Jaya 2 (SKDJ 2), to analyze the item reliability and face and content validity of the test

#### Teacher briefing session

A briefing session that took about 45 minutes was held at SKDJ 2 two days before the test for both standard one and standard two teachers - there were four teachers. These teachers were also given a teacher's copy of the test and asked to make comments and recommendations for any changes during the session, after which the test was collected back. By obtaining teacher views, I hoped to obtain content validity feedback. During the session, I reviewed the contents of the test and explained its usage as a screening device for reading ability, noting the various areas of reading ability that are being tested. They were also briefed on the test administration procedures. Teacher instructions were prepared and we reviewed the whole test together. The teachers were also provided with information about dyslexia. Only the standard two teachers administered the USBBM test to two classes of 90 students for this first field test.

#### USBBM field test

Two days later, the USBBM test was delivered in the morning to the office administrator, who passed them to the teachers. Children in two classes of 44 and 46 standard two class students were given the test, administered by the class teacher. Written instructions were provided for the teachers.

This test is like any teacher test in that it was administered as a part of regular class activities and was expected to take no longer than one hour.

Teachers were told to stop at one hour - if students could not finish, then it would already be an indication of their difficulty in reading. The teachers did, however, administer the test at the same time for both classes to avoid contamination of the results. Letters of consent were prepared and sent out to the students families a week in advance. The completed test was collected at the end of the school day and a post testing briefing session was held to obtain feedback and any recommendations for changes on the test or its administration. They both suggested the test was too long. For students who perform well, they had no difficulty completing the test. For those who were having difficulty, most did not have sufficient time to finish or just did not have the ability to complete the test. Based on these comments and the item analysis, the test was fine tuned and shortened.

#### Test administration

The USBBM is an informal reading test that is curriculum-referenced and included several subtests. The first section tests oral reading and listening comprehension skills. The teachers were instructed to read a short paragraph two times. Afterwards, there were five questions asked orally, also two times, to test oral comprehension skills. The students were asked to write the answers to the questions they heard on the first section of the test. Second, to test oral decoding skills, graded word lists were read orally by the teacher and the students wrote and spelled what they heard. Each word was pronounced two times only.

The second portion of the screening test was done silently, which the students could complete at their own pace. However the teachers were instructed

to read the directions for each section of the test before students began on their own. Students were tested on syllable or “suku kata” knowledge, consonant and vocal word completion, and choosing the correct word in alphabetized word groupings. A final section would include two reading passages, one at first grade comprehension level and the next at second grade level. They were both followed by five questions each for comprehension at different levels based on Bloom’s taxonomy.

#### Scoring of the tests

The results of this informal reading assessment were expected to indicate which children were experiencing difficulty with reading. Since it is the beginning of the school year, children in standard two would be expected to have developed reading skills with some fluency and automaticity. The test results were compared to the end of year grades from standard one for concurrent validity.

Table 2. Levels of reading ability for the USBBM

Level	% correct		= USBBM score	
	Word recognition	Comprehension	Word recognition	Comprehension
Independent level	60-100	95-100	66-110	13
Instructional level	41-59	75-94	45-65	10-12
Frustration level	< 40	< 74	<43	< 9

Those that fell beyond -1 SD below the norm of the group were considered weak at reading. After compiling the item analysis results of the field test using the split-test reliability method and taking into consideration teacher feedback, item correction was undertaken and the test was prepared for Stage Two of the actual case study in S. K. Taman Kooperasi Polis - Fasa 2 (SKTKP).

#### Stage two - pilot test of the USBBM

Stage Two would be a repetition of stage one, except it will be carried out on the whole of standard two in the case study school SKTKP. In this school, there were 6 standard two classes with a total of 255 students and 6 class teachers. Each class had between 36-48 children in it. Letters of permission (Refer to Appendix K) were prepared and sent out via the school a week before the intended screening test date.

#### Briefing session

First, a briefing session was held with the Head Mistress/Afternoon Supervisor and all of the teachers to explain the research project and to define for them what is dyslexia. Next, the contents of the test and the administration procedures were explained. Its usage as a screening device for reading ability was also explained, noting the various areas of reading ability that are being tested. At this time, class lists were collected from the teachers who were notified in advance that this information would be needed.

#### Test administration

The test was delivered before school started to an office administrator who saw to it that each teacher was given the tests pre-counted for their class.

Tests were pre-counted to be certain the same amount was given out and returned at the end of the test to maintain the integrity of the testing. With this group, the actual test was only given out on the day of the screening session and not before, to avoid any possible “contamination” of the test and the subsequent data collection. As such, the entire standard two was required to have the test administered at the same time. The teachers administered the test and then returned all completed and uncompleted tests to the office, where I was waiting to collect and count them.

#### Scoring of the tests

Scores on the screening tests were compiled and those that had less than 60 % correct on the USBBM, according to the scoring reported in table 2, were recommended to proceed to the third stage, which was the in depth diagnostic assessment. A second round of letters of permission (Refer to Appendix H) was sent out to these students in the hopes of receiving full cooperation of the children, the parents and the class teachers in order to gather all of the necessary data to complete the individual student evaluations and recommendations for remediation.

#### Stage three

##### Mental ability testing

In the third stage, the diagnostic reading test, the “Ujian Diagnostik Bacaan Bahasa Malaysia” (UDBBM) and a culture fair mental ability test, the Raven’s Colored Progressive Matrices were administered by me and a few research assistants. Those children who were screened out from the USBBM as having difficulty, were scheduled to be given a test for intelligence, the Raven’s CPM.

This culture fair test has earned wide acceptance in academic circles for the purpose of testing children whose first language is NOT English. This was given in groups of six, due to the limited number of test copies available.

#### Scoring of the mental ability tests - the Raven's CPM

Scoring was measured against the international norms for developing countries obtained from the Raven's CPM manual. Students who fell into the +1 SD or the 50th percentile and above would be considered of adequate mental ability to be expected to be performing at the standard two level in academic areas. Those whose score fell below that range would still need remedial assistance for their reading, however, they would not be considered as dyslexic, but as disadvantaged readers or as slow learners, due to their general low mental ability.

#### Briefing for CPM test administrators

Volunteers from the Parent Teacher Association who had agreed to help with the mental ability testing were briefed and given two training sessions on the administration and make-up of the test. The first session was an introductory session to brief them about the test, its purpose and their role as test administrators. They were asked to take the test themselves so as to be familiar with it. The second session was an actual trial administration of the test to a group of six students, so that they would be prepared for the actual testing dates. There was one assistant to monitor two students, hence three assistants were sufficient for six students to be tested.

#### Administration of the diagnostic reading test - the UDDBM

The children who were screened out from the USBBM were given a more in-depth diagnostic reading test which was previously developed and field tested earlier this year. A letter of permission (Refer to Appendix L) was sent out to each of the 60 student's families to inform them their child was being asked to take further tests. Only two families declined to continue with the testing.

Based on an item analysis of the first field test and after further consultation with first grade teachers, fine tuning and item correction were undertaken. Item reliability ranged from .20 to .90, which gives a good range of items which is needed in a test of diagnostic nature. This was considered a pilot test for this diagnostic reading test which was constructed for standard one and two level readers. This was an oral test that was conducted on a one-to one basis with each student. The test is more focused on decoding and comprehension skills and includes syllables or "suku kata", basic sight words, "nonsense" words and three short paragraphs to test comprehension.

#### Scoring of the diagnostic reading test - the UDDBM

This test was graded via a miscue analysis of oral reading skills. The test is a fully oral test and therefore, a miscue analysis served to identify the specific reading skills that are presenting difficulty to each child. Raw scores were calculated to determine the class means and SD. With this test, it was already assumed that the students were poor readers, therefore, scores were reported based on their percentage correct, a count of error type and their calculated reading

rate. According to accepted standards for informal reading inventories, the students' level of reading rate was calculated :

$$\frac{\text{number of words read}}{\text{time in seconds}} \times \frac{60}{1} = \text{reading rate}$$

From the previous field test of the UDDBM, a reading rate was calculated from the 16 out of 20 sample group that had valid scores. The mean reading rate of 34.15 words per minute, as shown in Table 4, was used as a gauge for this case study group.

Table 3 . Reading rate from the March 98 UDDBM field test.

N	Range	Minimum	Maximum	Mean	SD	Variance
16	74.68	5.84	80.52	34.1569	22.9707	527.652

There were two separate scores for comprehension and word/paragraph reading and it should be noted that the percentage correct was counted differently for each. Reading and comprehension scores from both the USBBM and the UDDBM were reported separately, bearing this in mind.

Table 4. Levels of reading ability for the UDDBM

Level	% correct		= UDDBM score	
	Word recognition	Comprehension	Word recognition	Comprehension
Independent level	60-100	95-100	125-208	8
Instructional level	41-59	75-94	85-124	6-7
Frustration level	< 40	< 74	<84	< 5

The types of errors or miscues that were counted are reported in this research paper as follows :

- misp - mispronunciation or “sebutan salah”
- subs - substitution or “pengantian”
- ref - refusal to pronounce or “menolak”
- rev - reversal of letter or syllable or “pembalikan”
- add - addition of letter/syllable or “penambahan”
- omis - omission of letter/syllable or “tinggalkan”

The final scores for all of this were reported on a reporting record, the “borang rumusan”, with a complete analysis of the errors and scores for each section, scores from the USBBM and the Raven’s CPM, together with a recommendation for remedial work based on the miscue or error analysis. Copies of these were given to both the headmistress of the school and the families.

#### Collection of qualitative data

Dyslexia is defined by those students who are of average or above intelligence level but for some reason are performing below the expected reading level for their grade. Therefore, those students whose reading ability fell in the -2 SD and whose mental ability fall in the +1SD or above would be suspected of dyslexia and would be subject to further inquiry by gathering qualitative data.

Detailed questionnaires were given out to the families to gather further information about the screened out children. A behavior checklist was given to the teachers to fill out. Many correlations of behavior problems and dyslexia have