



المؤتمر الدولي الأول للقياس والتقويم
The First International Conference on Assessment & Evaluation

Mapping Students' Performance in English Reading Literacy Using the Rasch Measurement Model

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Introduction

- Monitoring is a set of systematic and regular procedures to collect information on particular areas ...(Husen & Tuijnman, 1994)
- Monitoring learners' performance over time and across grade levels is essential
- It helps ensure that students are improving and achieving expected levels

- The concern is with how much students have achieved across their levels and over time
- TIMSS & PISA
- Much more should be done at national level
- Tests are typical instruments to measure students' performance
- Models to ensure the interpretation of tests results
- The Rasch Model is one of the reliable and practical models
(Linacre, 2003)

RMM and Monitoring of Performance

- RMM has robust properties
- To monitor students' educational growth or progress over time
- To compare groups of students at different year/grade levels of schooling over time
- It displays clearly the locations of learners in relation to the levels of increasing competence

It transforms the non-linear test scores into linear measures (Bond & Fox, 2007).

- Item-ability maps & skill-ability maps
- Examples: TORCH tests (*Test of Reading Comprehension Skills*); Australian Language Certificate (ALC) project; the ACER's Longitudinal Literacy and Numeracy Study; (LLANS); and so forth

In the Malaysian Context

- Monitoring and evaluation of students' learning and achievement are conducted primarily through national standardized examinations such as the PMR and SPM
- Data collected from these exams only show the performance at a particular level of schooling, rather than how much have been achieved across their grade levels

- These examinations are also norm-referenced, making it impossible to determine the skills and knowledge that have been and have not been acquired.
- Malaysia has been participating in TIMSS & PISA
- Still, there is a need for more efforts to monitor students' performance across grade levels and over time.

Purpose of the Study

- To highlight the importance of a more robust national approach to monitoring students' performance in English reading literacy skill.
- Data collected will provide information which will help students, parents, teachers, and schools to form a complete picture of what students have achieved and what has yet to be achieved.

Method

- It is descriptive in nature.
- Population: Form 1, 2, and 3 students from national-type schools in two states in Malaysia.
- Sample : 944 students randomly selected from 11 schools

•Data Collection

- A sixty multiple choice question reading test was compiled (20 grammar and 40 reading comprehension items)
- Items were classified based on the skills/ sub skills associated with them

- The test required students to apply the reading skills that they have acquired across their level with different types of texts and contexts
- Reading texts were of varying difficulty levels e.g., passages, messages, extracts of a story, notes, a poem...
- Contexts (linear & non-linear)

- Data Analysis
- Rasch Measurement Model Analysis
- Statistical software Winsteps, version 3.72.1:
- First, the adequacy of the reading test was investigated
- Second, the Wright item-ability and skill-ability maps were produced
- SPSS version 16 was used to find out the Means, Standard Deviations and Medians

Results

- On average the students, as a group, were more able than the item difficulty (Means 0.30 logit & 0.0 logit)
- Student ability measures spanned about 6.73 logits (from -2.07 to + 4.66) while the item difficulty measures spread about 5.06 logits (from -2.08 to + 2.98).
- See Figure 1 : Wright Item- Ability Map

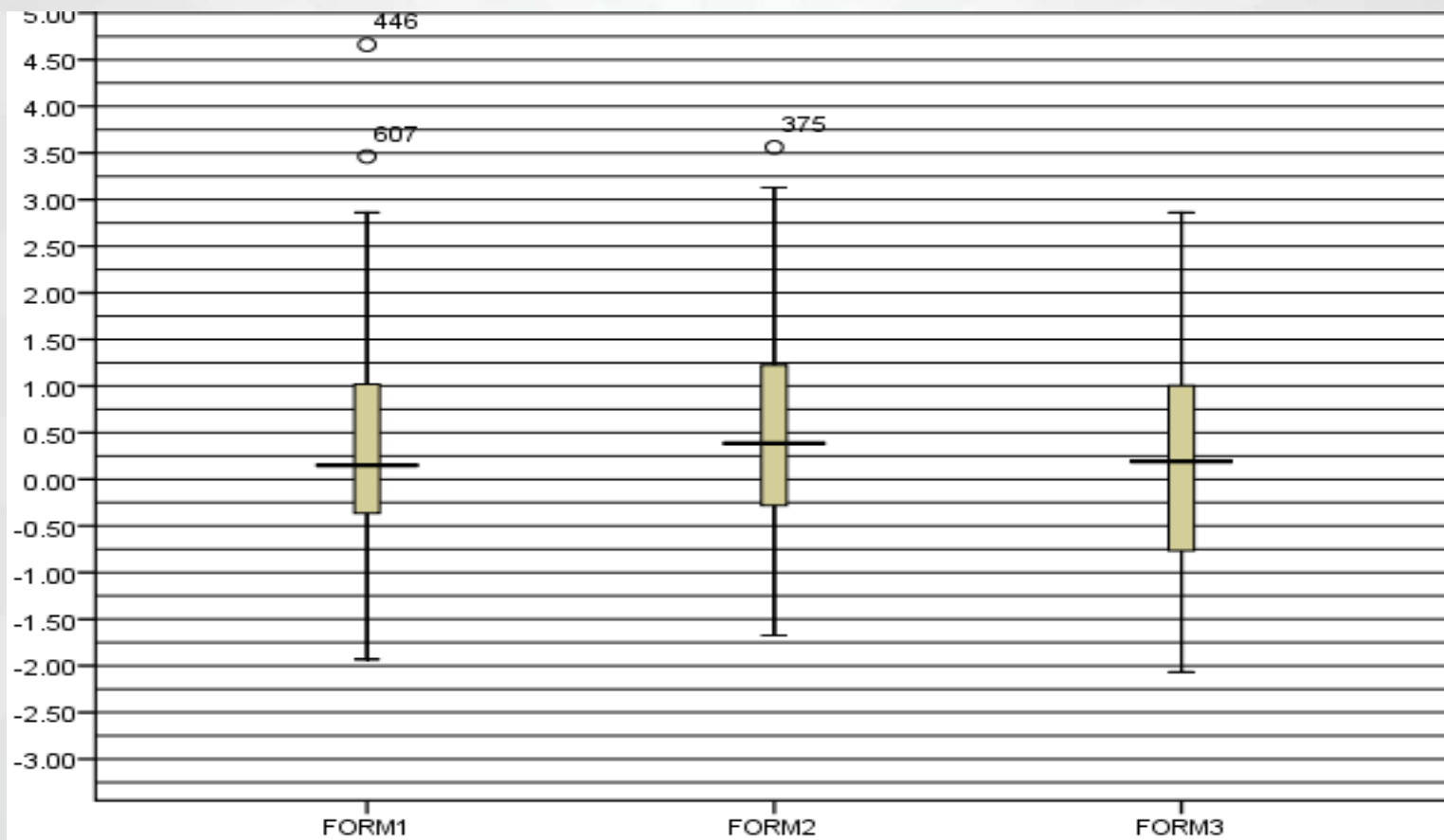
- Figure 2 shows the distribution of all skills associated with items included in the reading test.
- It illustrates what skills students can and cannot apply.
- See Figure 2: Wright Skill-Ability Map

- Students' Performance across Forms
- On average, Form 2 students, as a group, performed slightly better than Form 1 students, who, in turn, performed better than Form 3 students.
- Means: Form 2 (0.48 logit); Form 1 (0.30 logit); and Form 3 (0.15 logit)
- See Table 1 & Figure 4

Means and Medians

Form	Mean	Median	Std. Deviation	Std. Error of Mean	<i>n</i>
FORM 3	.15	.19	1.05	.056	352
FORM 2	.48	.38	1.03	.060	293
FORM 1	.30	.15	1.00	.057	299

Form 1, Form 2 and 3 Distribution



Discussion

- Based on the Wright skill-ability map, the students' reading performance was divided into four levels to illustrate what students can and cannot do at each level
- The levels are ordered from the lowest level (Level 1) to the highest level (Level 4).

- It can be said that both Level 1 and Level 2 may represent the literal level, the easiest level of reading comprehension in Barret's taxonomy
- Certain skills were not found at preliminary levels because they often require students to make use of other skills to get a correct answer (Brown, 2003)

- One possible reason to explain the poor performance of Form 3 students is the spiralling nature of the English Language curriculum for lower secondary.
- Moreover, this result is possibly influenced by demographic variables such as gender, school location, socio-economic status, parents' education...etc.

- these results highlight the importance of tracing and monitoring of students' performance across grades and over time, to ensure that students are progressing as expected and planned.

Conclusions

- A need for a better measurement approach
- RMM can be used to measure students' performance across levels and over time
- Wright maps play a role in this respect
- Without such data, comparisons across cohorts cannot be effectively achieved
- Further studies are needed to profile students' performance in terms of their backgrounds.

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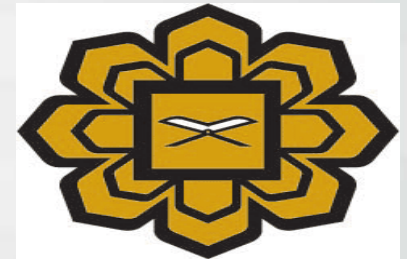
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