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

<table>
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<th>Form</th>
<th>Mean</th>
<th>Median</th>
<th>Std. Deviation</th>
<th>Std. Error of Mean</th>
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<td>0.056</td>
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<td>1.00</td>
<td>0.057</td>
<td>299</td>
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</tbody>
</table>
Form 1, Form 2 and 3 Distribution

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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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