School-age learning assessment tools: The Foundational Learning Skills module

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Questions

1. Why a Foundational Learning Skills module for household surveys?
2. How was it developed and validated?
3. What does it assess? How? What indicators does it yield?
4. Is it valid? Reliable? Fair?
5. How can its data reveal equity and education policy issues?
Learning over the life course: From early childhood to adolescents, youth and adults

Learning in the SDGs
• 4.2.1 – ECD: Early Childhood Development Index (MICS, etc.)*
• 4.1.1 – basic education
  a) Early grades: Foundational Learning Skills (MICS, etc.)
  b) End of primary: Regional assessments (SEA PLM)
  c) End of lower secondary
• 4.4.2 – Digital literacy skills
• 4.6.1 – Youth and adult literacy
• 4.7.1 – Education for sustainable development and citizenship (MENA’s LSCE; EAPRO’s SEA PLM)

Global Alliance to Monitor Learning (GAML)

* 4.2.1 is a development indicator not focused only on learning
We don’t know what *all* children know

Learning Assessment Capacity Index (LACI): diversification of large-scale assessments 2010-2015

Source: UNESCO Institute for Statistics.
http://uis.unesco.org/apps/visualisations/laci/
**MICS and FLS in sub-Saharan Africa**

- **22** countries out of 49 in SSA will be covered by MICS in the next three years
- **9** emergency countries will have comparable learning data

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**MICS Countries SSA**

- Central African Republic*
- Democratic Republic of the Congo*
- Gambia
- Ghana
- Guinea-Bissau
- Lesotho
- Madagascar*
- Malawi*
- Sao Tome and Principe
- Sierra Leone
- Zimbabwe*
- Chad*
- Togo
- Eswatini
- Botswana
- Kenya*
- Equatorial Guinea
- Benin
- Sudan
- Cameroon*
- Cote d’Ivoire
- Nigeria *

[https://mics.unicef.org/](https://mics.unicef.org/)
• The paper details the process of development and validation of the instruments
• Collaboration funded by the Hewlett Foundation, with inputs from ASER/Uwezo, RTI, Save the Children, GEMR, GPE, UIS, WB
• The paper describes field tests in Belize, Costa Rica, Ghana and Kenya
1) Parental Participation (in child’s learning) – Mothers or caregivers

2) Foundational Learning skills – **Children aged 7-14** (one per household)

- Unscripted rapport-building exercise
- Learning environment – reading habits, languages at home and in school
- **Foundational reading skills** (3 indicators + 1 overall indicator)
  1. % who read 90%+ of words in **story** (70 words, 2nd grade vocabulary)
  2. % who answer 3 out of 3 literal comprehension questions
  3. % who answer 2 out of 2 inferential comprehension questions
- Foundational number skills (4 indicators + 1 overall indicator)

Total interviewer-child interaction: 15 minutes (on average)
A focus on **comprehension**: Yes, but which one(s)? (Basaraba et al. 2013)
- Assessed: Literal (3 questions); inferential (2 questions)
- Not assessed: evaluative or summary

**Oral reading accuracy of connected text** (Garcia et al., 2013; Grigorenko et al. 2008).

Why not... **fluency**?
- Administration in households (Dowd & Pisani, 2016)
- Comparability across languages (Piper et al., 2015)

... **oral language**? Time constraints, but there is a survey question on home language

... **building blocks**? Comparability across languages

Foundational Reading Skills, Kyrgyzstan

Foundational Reading Skills: SDG 4.1.1.(a) (i: reading)

- Reads 90% of words correctly in story: 80%
- Answers literal comprehension questions correctly: 76%
- Answers inferential comprehension questions correctly: 67%
- Has foundational reading skills*: 58%

*Percentage of children age 7-14 who can 1) read 90% of words in a story correctly, 2) Answer three literal comprehension questions, 3) Answer two inferential comprehension questions
Out of the five classical domains in mathematics, the module currently focuses on one, namely Numbers. The domains of Measurement, Statistics and Algebra may be too advanced for the early grades. The possibility of adding Geometry items should be explored.
Foundational Numeracy Skills: SDG 4.1.1(a) (ii: numeracy)

- Number reading: 97%
- Number discrimination: 94%
- Addition: 93%
- Pattern recognition and completion: 88%
- Has foundational numeracy skills*: 82%

*Percentage of children age 7-14 who can successfully perform 1) a number reading task, 2) a number discrimination task, 3) an addition task and 4) a pattern recognition and completion task
Based on a special study on concurrent validity and inter-rater reliability in Kenya in 2016

Internal consistency is high for reading comprehension, and acceptable for numeracy

Agreement between scorers is very high, more stringent Inter-Rater Reliability measures are still high

Concurrent validity with EGRA and EGMA is acceptable
The reading comprehension task is highly reliable (Cronbach’s alpha = 0.96)

The reading comprehension items...
- ...increase in difficulty as the test progresses, and as they shift from literal to inferential comprehension
- ...contribute equally to the estimation of ability
- ...show no signs of bias, or Differential Item Functioning (DIF), by location or gender
Wealth and learning poverty

Percentage of children ages 7-14 who could read a short, simple story (grade 2/3 level) and answer 5 questions about it, by wealth quintile (MICS 6)

- **Madagascar**
  - Richest quintile: 58%
  - Poorest quintile: 5%

- **Pakistan**
  - Richest quintile: 51%
  - Poorest quintile: 14%

- **Sierra Leone**
  - Richest quintile: 39%
  - Poorest quintile: 3%

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*Source: UNICEF (MICS 6)*
Inequities in Parental Involvement among 7-14 year olds in MICS 6, Sierra Leone, 2018
Teach every learner at their level

Percentage of children ages 7-14 who could read a short, simple story (grade 2/3 level) and answer 5 questions about it (Sierra Leone, MICS 2017)
Among children schooled in English, and after controlling for grade, household wealth and gender, speakers of Krio (an English-based creole lingua franca) were twice as likely to comprehend the English-language story as compared to speakers of Mende (a language unrelated to English).
Answers

1. Why? To feed into the SDGs and address learning poverty issues
2. How? Developed in collaboration, validated around the world
3. What? Reading (accuracy; comprehension both literal and inferential) and numeracy (number identification and discrimination, addition, missing number)
4. It is valid (concurrently with EGRA/EGMA), reliable (Cronbach’s alpha) and fair (no DIF by gender or location)
5. It shows the need for more equitable, inclusive policy approaches


THANK YOU!
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Where is the Multiple Indicators Cluster Survey implemented?

22 years
113 countries
307 surveys

Notes: Countries with at least one MICS survey
Including sub-national surveys

https://mics.unicef.org/
### Reliability (I): Internal Consistency

**Foundational Learning Skills module, Kenya, 2016**

<table>
<thead>
<tr>
<th>MICS Foundational Learning Skills Subtests</th>
<th>Number of items</th>
<th>Cronbach’s Alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral Reading Accuracy</td>
<td>43</td>
<td>.9115</td>
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<tr>
<td>Reading Comprehension</td>
<td>5</td>
<td>.8269</td>
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<tr>
<td>Foundational mathematical skills</td>
<td>21</td>
<td>.7762</td>
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<tr>
<td>Skill</td>
<td>Kappa</td>
<td>PNA</td>
</tr>
<tr>
<td>------------------------------------------</td>
<td>-------</td>
<td>------</td>
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<tr>
<td>Oral Reading Accuracy</td>
<td>.738</td>
<td>.761</td>
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<tr>
<td>Reading Comprehension</td>
<td>.873</td>
<td>.877</td>
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<tr>
<td>Number Identification</td>
<td>.937</td>
<td>.937</td>
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<tr>
<td>Number discrimination</td>
<td>.924</td>
<td>.940</td>
</tr>
<tr>
<td>Addition</td>
<td>.894</td>
<td>.897</td>
</tr>
<tr>
<td>Pattern recognition and completion</td>
<td>.891</td>
<td>.902</td>
</tr>
<tr>
<td>(missing number)</td>
<td></td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th></th>
<th>90% Accuracy</th>
<th>Literal Comprehension</th>
<th>Inferential Comprehension</th>
<th>Basic reading skills</th>
<th>Total Count</th>
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</thead>
<tbody>
<tr>
<td>Non-/Beginning</td>
<td>12.5%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>16</td>
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<tr>
<td>Emergent</td>
<td>53.8%</td>
<td>33.3%</td>
<td>5.1%</td>
<td>0%</td>
<td>39</td>
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<tr>
<td>Reader</td>
<td>92.0%</td>
<td>94.2%</td>
<td>84.7%</td>
<td>74.5%</td>
<td>137</td>
</tr>
<tr>
<td>Total</td>
<td>77.6%</td>
<td>74.0%</td>
<td>61.5%</td>
<td>53.1%</td>
<td>192</td>
</tr>
</tbody>
</table>

*percentage of children in each EGRA Literacy grouping who were able to successfully complete the MICS Literacy indicator
Linguistic and SES differences between selected home languages


Mende  *Population:* 1,940,000 in Sierra Leone (2016). *Classification:* Niger-Congo, Mande, Western.

https://www.ethnologue.com/country/SL/languages

<table>
<thead>
<tr>
<th>Combined wealth score</th>
<th>Language child speaks most of the time at home</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>KRIIO</td>
<td>5648</td>
<td>0.95</td>
<td>1.12</td>
</tr>
<tr>
<td></td>
<td>MENDE</td>
<td>3722</td>
<td>-0.35</td>
<td>0.52</td>
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Does home language matter?

<table>
<thead>
<tr>
<th>Variables in the Equation</th>
<th>B</th>
<th>S.E.</th>
<th>Wald</th>
<th>df</th>
<th>Sig.</th>
<th>Exp(B)</th>
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<tbody>
<tr>
<td>GRADE</td>
<td>.384</td>
<td>.018</td>
<td>451.561</td>
<td>1</td>
<td>.000</td>
<td>1.469</td>
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<tr>
<td>GIRL</td>
<td>.194</td>
<td>.067</td>
<td>8.245</td>
<td>1</td>
<td>.004</td>
<td>1.213</td>
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<td>Combined wealth score</td>
<td>.317</td>
<td>.034</td>
<td>89.011</td>
<td>1</td>
<td>.000</td>
<td>1.374</td>
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<tr>
<td>KRIIOHL</td>
<td>.718</td>
<td>.094</td>
<td>58.285</td>
<td>1</td>
<td>.000</td>
<td>2.050</td>
</tr>
<tr>
<td>Constant</td>
<td>-2.824</td>
<td>.129</td>
<td>478.271</td>
<td>1</td>
<td>.000</td>
<td>.059</td>
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