Mobile Resources to Promote Teacher Efficacy in Teaching Children with Disabilities in Ethiopia

Carmen Strigel, RTI International
Inclusive Education in Ethiopia
Children with disabilities are underrepresented in low and middle-income country schools....

.... in spite of prevalent inclusive education policies.
Inclusive Education in Ethiopia

- National prevalence rate of low vision in Ethiopia: 3.7%; 1.6% for blindness (Berhane et al., 2008).

- Contrasts with only 0.38% of children in Ethiopian primary schools reported to have a disability (Ministry of Education, 2016).

These data indicate significant gaps in the enrollment of children with disabilities in Ethiopia’s primary schools.
Increased teacher adoption of inclusive instructional practices in regular reading classrooms
Implemented as a “proof of concept” through regional working groups

- **63 schools, 109 classrooms** in 5 regions of Ethiopia
- **7 mother tongue** languages

Inputs include:
- **Screening tools** for vision and hearing,
- 2 days of initial **teacher training**,
- 2-day refresher training,
- inclusive **multimedia lesson plans on cell phones**,
- 2 **monitoring visits** per classroom

Implementation timeline: **3 months**
Improving Inclusive Education at Classroom Level in Ethiopia - Theory of Treatment (ToT; Leviton & Lipsey, 2007)

ToT Step 1 - PROGRAM MODEL

- **Input:** Regular grade 2 teachers (110 teachers) in inclusive reading classrooms that have previously received a 10-day training on reading instruction
- **Output:** Teachers have increased awareness about their students' sensory impairments
- **Input:** Receive accommodated, lesson plans on smartphones and a headset
- **Output:** Teachers have access to specialized materials to support inclusive reading instruction
- **Input:** Participate in two 2-day in-person training workshops with their principals
- **Output:** Teachers have the required skills to use the materials and inclusive practices
- **Input:** Receive two 1.5 hour classroom monitoring visits over three months
- **Output:** Teachers experience support in their adoption of inclusive instructional materials and practices

ToT Step 2 - IMPACT MODEL: Theory of Planned Behavior (TPB; Ajzen, 1991)

- **Intermediate Outcome (mediating variable):** Improved teacher attitudes to inclusive education
  - Measured pre-post by: 1. Teacher attitude scale
- **Intermediate Outcome (mediating variable):** Improved teacher self-efficacy in teaching students with sensory disabilities
  - Measured pre-post by: 1. Teacher self-efficacy scale
- **Intermediate Outcome (mediating variable):** Increased sense of subjective norms supporting inclusion
  - Measured pre-post by: 1. Teacher questionnaire

- **Outcome (dependent variable):** Increased teacher adoption of inclusive instructional practices in regular reading classrooms (behavior)
  - Measured at least twice through monitoring visits (progress/tidiness measure): 1. Teacher questionnaire 2. Lesson plan log
  - Measured pre-post by: 1. Classroom observation 2. Student questionnaire
Assistive Technology Instruments
Screening apps were selected for

- relevance for the purpose;
- simplicity in consideration of the intended target group;
- adaptability for the context; and
- clinical validity.
• Assistive technology working group and RTI team conducted screening at baseline
• Trained teachers on re-screening students in their classrooms
• Screening tools delivered as app on local smartphone with noise-cancellation headset
Inclusive Multimedia Lesson Plans (IMLP)

- Scripted explicit accommodations (in red) into reading lesson plans; added audio files for phonemic awareness and story activities
- Deployed to teachers as an app on smartphone
Student Findings
Screening results for Hearing Impairment (n=3,725)

- 4.86% of children flagged for HI
- 51% of children flagged for HI were female
Students with Vision Impairment (VI)

- Screening results for Visual Impairment (n=3,728)
- 5.37% of children flagged for VI
- 53% of children flagged for VI were female
Letter Sound Recognition – Zero-Score Reduction

- Trend shows notable reduction in zero scores in letter sound recognition for all children;
- Even larger reduction in zero scores for children with VI/HI compared to those without!

Sample size (baseline/endline): no VI/HI n= 328/296; VI n= 218/166; HI n= 180/162
Trend shows notable reduction in zero scores in oral reading fluency for all children.
Larger reduction in zero scores for children without HI/VI.

Sample size (baseline/endline): no VI/HI n= 328/296; VI n= 217/166; HI n= 180/162
Teacher Findings
Teacher Attitudes & Self-Efficacy: Baseline - Endline

Teacher attitude:
- Baseline: 34.51
- Endline: 40.97

Teacher self-efficacy:
- Baseline: 22.12
- Endline: 24.1

Max for teacher attitude = 50
Max for teacher self-efficacy = 30
I believe that the needs of VI/HI students can best be served through special, separate classes
I believe that a VI/HI student will develop academic skills more rapidly in a spec. class than in a reg. class
The extra attention that VI/HI students require will be to the detriment of the other students
I feel comfortable designing learning tasks appropriate for children with VI/HI
I believe that I have sufficient expertise, knowledge, and skills to teach VI/HI students in my reg. class
I think that inclusion promotes more academic growth of VI/HI students

Percent of teachers that agree or strongly agree to:

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<thead>
<tr>
<th>Statement</th>
<th>Baseline</th>
<th>Endline</th>
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<tbody>
<tr>
<td>I believe that the needs of VI/HI students can best be served through special, separate classes</td>
<td>64%</td>
<td>76%</td>
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<tr>
<td>I believe that a VI/HI student will develop academic skills more rapidly in a spec. class than in a reg. class</td>
<td>61%</td>
<td>93%</td>
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<tr>
<td>The extra attention that VI/HI students require will be to the detriment of the other students</td>
<td>37%</td>
<td>70%</td>
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<tr>
<td>I feel comfortable designing learning tasks appropriate for children with VI/HI</td>
<td>76%</td>
<td>91%</td>
</tr>
<tr>
<td>I believe that I have sufficient expertise, knowledge, and skills to teach VI/HI students in my reg. class</td>
<td>37%</td>
<td>71%</td>
</tr>
<tr>
<td>I think that inclusion promotes more academic growth of VI/HI students</td>
<td>70%</td>
<td>91%</td>
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<td>Inclusive Practices: Baseline - Endline</td>
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<th>Percent of observations that found the teacher to frequently:</th>
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<tr>
<td>Ensures students are paying attention before activity</td>
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<tr>
<td>Speaks clearly and loudly</td>
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<td>Speaks facing the class</td>
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<tr>
<td>Writes questions on the board</td>
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<tr>
<td>Writes lesson objective on the board</td>
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<tr>
<td>Repeats questions at least once</td>
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<tr>
<td>Uses a self-made teaching aid</td>
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<td>Uses material specifically for VI/HI</td>
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Teachers’ Voices

“My thinking about teaching children with VI/HI has changed a lot thanks to the initiative. It opened my eyes and enabled me to look at all students positively. I used to think that students with disabilities can’t learn well, but now I view things quite differently.”

“Before the training, I considered those HI students as lazy and mental retarded students but now after they identified I have changed their sitting, my methodology in the classroom, I have started to believe as they can achieve and learn as other students, I have also observed change on them in the classroom. They started to participate, they improved their result.”
Proof of Concept Study Limitations

- Proof of concept > **not aimed at full scientific rigor** or establishing causal relationships
  - Control group to establish reading acquisition among VI/HI children without intervention would have enriched results
  - Control group for just screening activity would have enriched knowledge base on relative contribution of identification versus accommodation on teacher behavior change

- **A larger sample size** to disaggregate analysis by levels of disability (mild, moderate, severe) would have enriched knowledge base on outcomes for different group of students

- Possibility of **false positives for hearing screening** due to environmental noise affecting precision of tool
Conclusion

- Technology-mediated resources appear **appropriate for context** and target group
- **Strong adoption** of smartphones and IMLP
- **More training**, specifically practice, needed for screening tools and/or simplification of hearing screening app
- Initiative successful in establishing initial **HI/VI prevalence**
- Initiative successful in **changing teacher attitudes, self-efficacy** and foundational classroom **practices** to promote inclusion for children with VI/VI
  - Identification most likely played a big part
- Intervention and timeline **not sufficient to close gaps** in reading achievement for VI/VI students
  - It is likely that that gap would have been even wider without intervention, but this needs to be confirmed through additional research
The assistive technology initiative in Ethiopia was implemented under the USAID-funded Reading for Ethiopia’s Achievement Developed Technical Assistance (READ TA) Project in collaboration with the Ethiopia Ministry of Education and the Regional State Education Bureaus of Amhara, Oromia, Ethio-Somali, Tigray, and SNNPR.