



An innovative tool for screening hearing impairments using commercially available tablets, headphones, and dedicated software for gaming.

Senior Researcher, Tone Øderud, SINTEF

Dr. Tron V Tronstad, SINTEF

Dr. Cosmas Mnyanyi, The Open University of Tanzania

Mr. Isaack Myovela, Patandi Teachers College

Dr. Jon Øygarden SINTEF/ NTNU

ASSISTIVE TECHNOLOGY BUSINESS INNOVATIONS, 29 Sep. 2021

Screening Children's Hearing in Tanzania

- Vision:
- Include children with hearing impairment in school and enable participation in society
- Partners:
- The Open University of Tanzania (OUT)
- Patandi Teachers College for Special Needs Education
- Norwegian University of Science and Technology (NTNU)
- SINTEF
- Funding:
- The Research Council of Norway, Vision2030



Concept Testing in Tanzania,

Photo: SINTEF



Background – Global Situation

- WHO has estimated that 466 million people have a disabling hearing loss
- 34 million of these are children and the majority live in low-income countries (WHO, 2018)
- UN Sustainable Development Goals
- UN Convention on the Rights of Persons with Disabilities (CRPD)
- Leave No One Behind
- Nothing About Us without Us



Addressing UN Sustainable Development Goals no. 1, 3, 4, 10, 17

Background – from Tanzania

- Population: 56 millioner
- Few facilities for screening children, limited number of trained personnel and shortage of appropriate hearing aids
- Many children with hearing loss are not included in school or drop out



Project Objectives

1. Develop affordable screening tools and innovative hearing devices appropriate for children in low-resourced settings.
2. Develop a sustainable community-based model for hearing services in Tanzania.
3. Develop Training programs for schoolteachers and health care staff in Tanzania.



Screening tools



Sustainable community-based service model and training programs



Concept Sketch of Hearing Enabling Device (HED)

Game-Based Screening Tools for Children

- Game-based, automatic and rapid screening of children in primary school
- Will identify children with hearing loss that need further follow up (loss above 25 dB)
- 500 Hz, 1000 Hz, 2000 Hz, 4000 Hz
- Screening performed by teachers in primary schools



Screening 400 children

Results

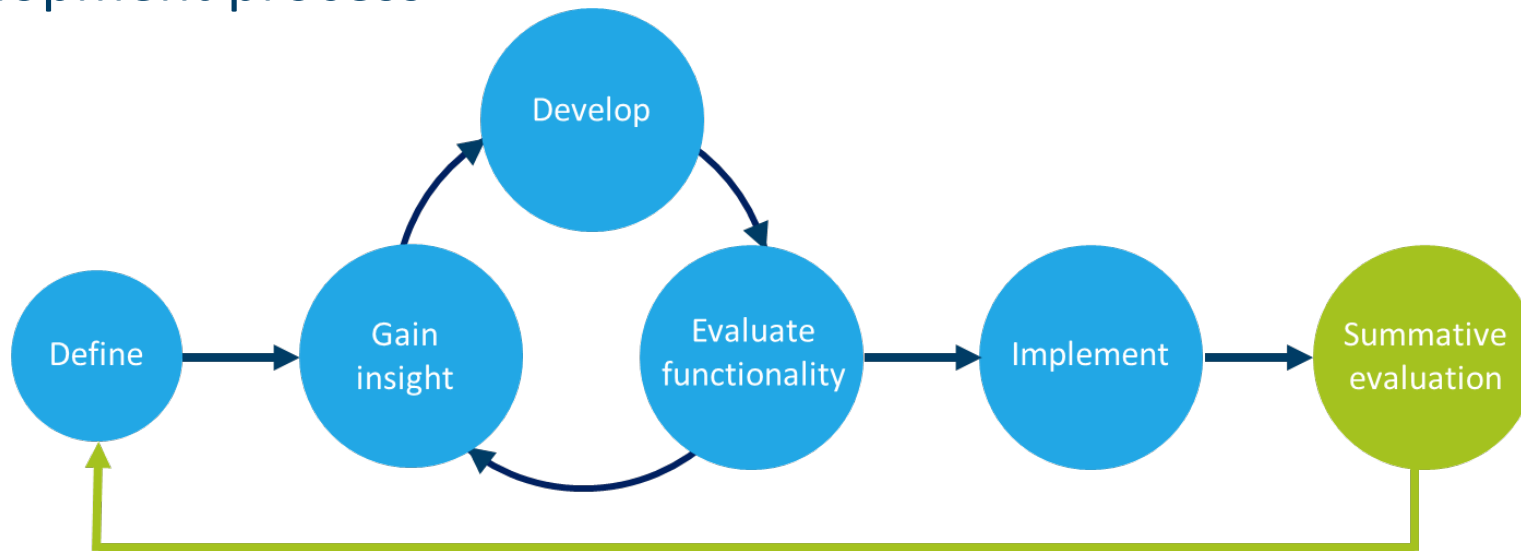
- The prevalence of hearing loss among children in primary school varied from 7% - 17% depending on the various schools
- Main causes of hearing loss were
 - Earwax and foreign body
 - Ear infections/ otitis
- Hearing loss might be locally treated and prevented
- Need for collaboration between education and health sector

Local Hearing Care Interventions



Research Based Innovation*

- Human Centered Design - Involve all relevant stakeholders throughout the process;
 - Government through Ministry of Education and Ministry of Health at national and local level, special teachers, school teachers in primary and secondary, ENT professionals, parents organizations and children
- Iterative development process



Testing at Patandi Teachers College, Arusha



Feedback from Children, Tanzania



Leave No One Behind





Technology for a better society