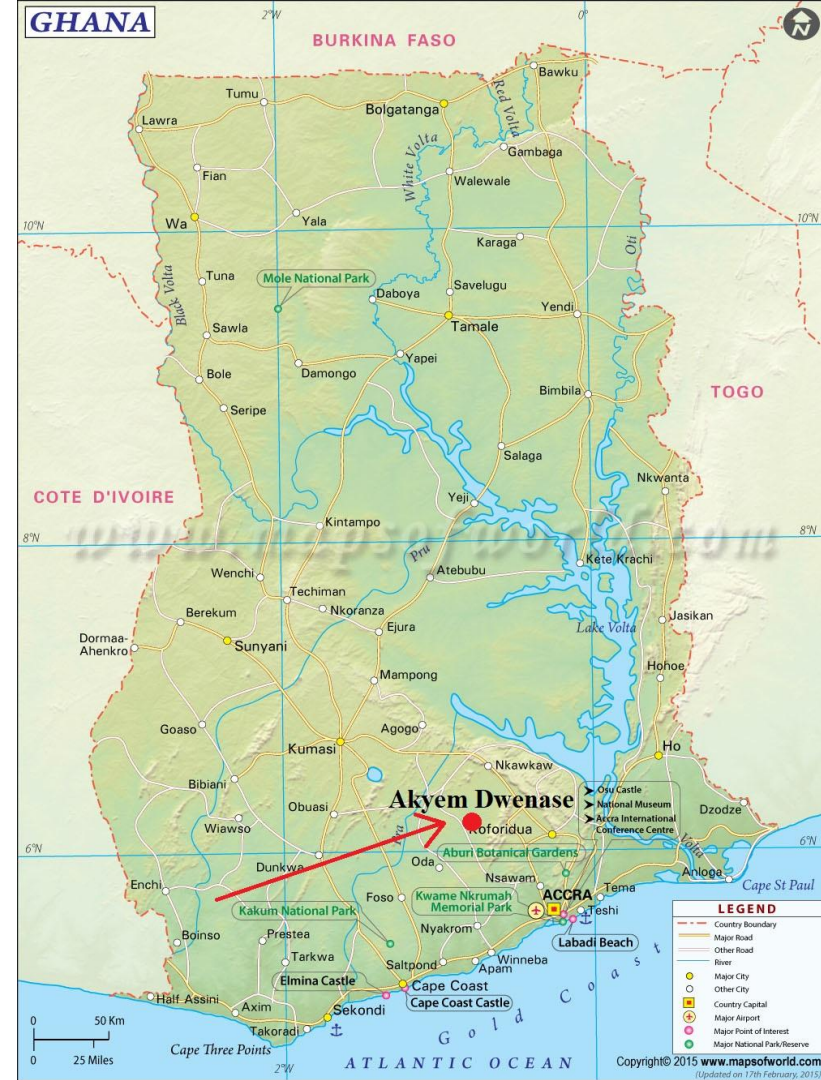


Teaching and Learning Materials Development Project

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Location - Akyem Dwenase, Ghana

- Ghana Interactive Qualifying Project Site
 - Eastern Region
 - Rural farming community
- Project Site
 - Dwenase Presbyterian primary School
 - Grades 1-6



Background - Major Problems

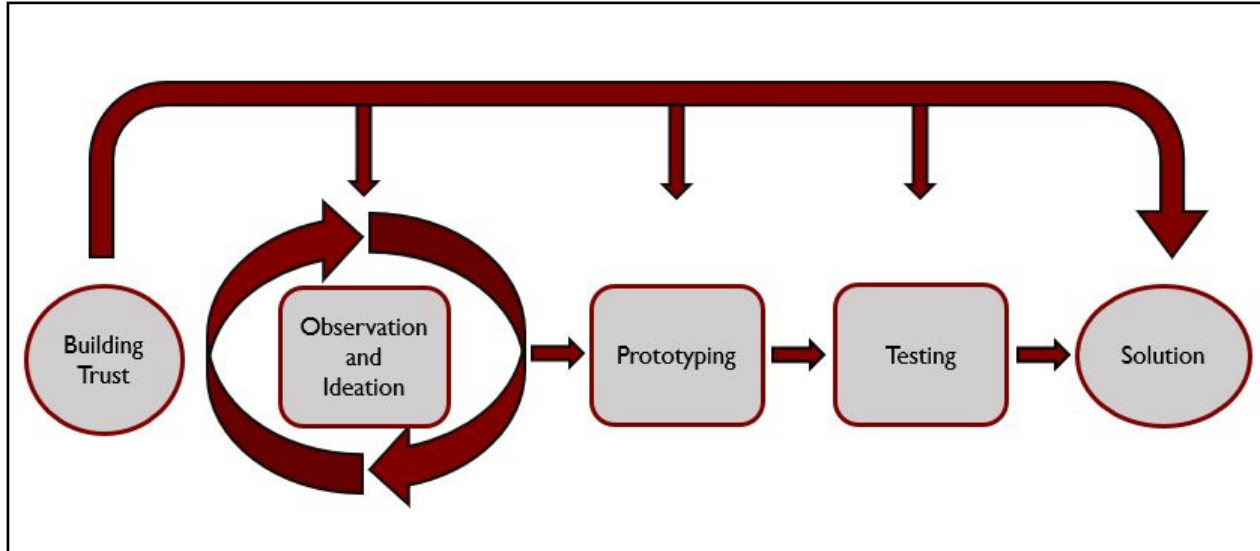
- Teaching methods are abstract
 - Focuses on:
 - Memorization
 - Textbook reading
 - Lack of:
 - Visual tools
 - Physical materials
 - Pre-made, government provided made tools
- Lack of Funding
 - Government allocation per student for 2017-2018
 - 4.5GHC = \$0.80
 - Spent during 2017-2018 school year
 - 420.65 GHC = \$84



Item	Quantity	Unit Cost	Total Cost
Manila cards	15	1	15
permanent markers (box)	1	5	5
P4 RME textbook	1	18	18
P3 RME textbook	1	18	18
Golden English P6	1	25	25
Correcting pen	4	2	8
Pens	12	0.6	7.2
P3 ICT textbook	1	18	18
Lesson note book	2	20	40
Wall clock	1	30	30
Serving tray	1	10	10
Floor carpet (yards)	6	9	54
Drum head	2	40	80
Culture			20.7
Sports			51.75
Nails (2 1/2 inches)	1	5	5
Minor repairs			15
			420.65

Design Process

- Emphasis on the principle of co-design
 - Working alongside the community and building authentic relationships
 - Designing solutions that benefit and suit the community



Building Trust

- Enabled co-design
 - Allowed us to understand our collaborators
 - Allowed our collaborators to fully engage with our ideas
 - Ghanaian culture is very polite, wanted to encourage collaborators to be open with us
- Engaged in community activities
 - Watched soccer matches at home and neighboring villages
 - Taught mini-lessons at the primary school (with teacher supervision)
 - Volunteered during community work days



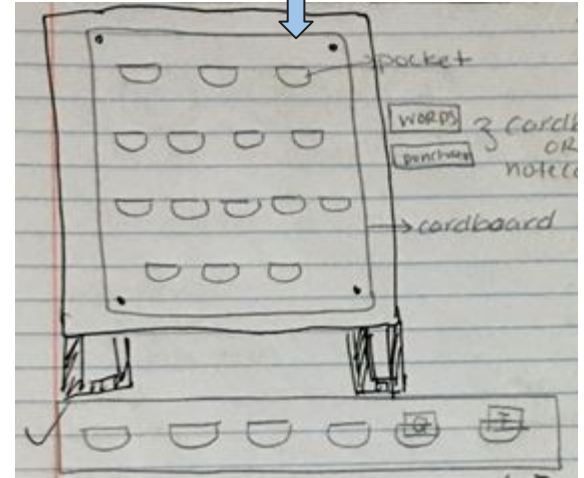
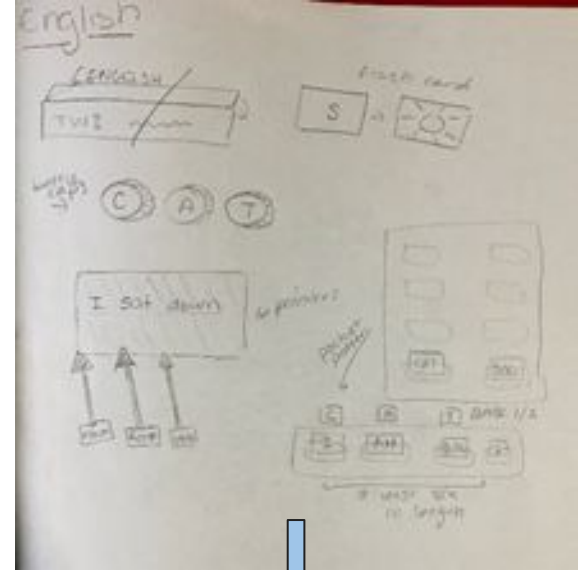
Observation

- Observed each classroom for 2 class periods
- Observations:
 - Community based learning
 - Extremely interactive classrooms
 - Brand new curriculum
 - Students owned various, inconsistent school supplies



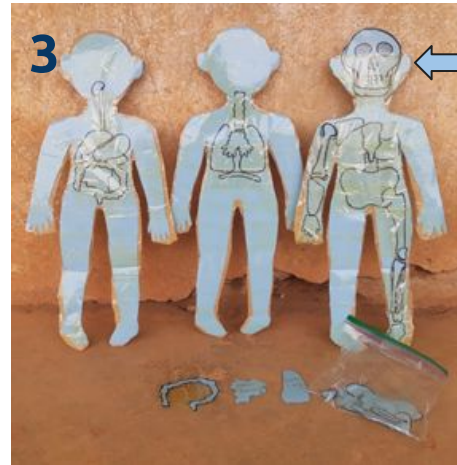
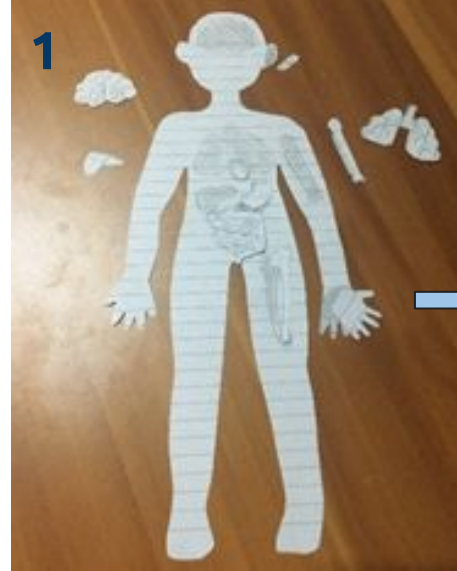
Ideation

- Step 1: Listening to collaborators
 - Integral Takeaways:
 - Needed to reexamine curriculum
 - Focus on locally available resources
 - Cassava plants to make glue
 - Re-using cardboard boxes to make posters
 - Purchasing materials from markets only in neighboring towns
 - Focus on needs of the individual teachers
 - No 'one-size-fits-all' solution
- Step 2: Physical Ideation
 - Used paper and pencils
 - Real-time editing and idea formulating
 - Equal participation for all involved parties



Prototyping

- Creating tools for specific lessons
- Refining the design
 - Multiple iterations of the same design
- Defining the purpose of the design
 - Alongside the teachers
 - In the context of the Dwenase Primary School
- Using exclusively local and cheap materials
 - Each TLM was < 5GHC = \$1



Testing

- Observed teachers using the tools
 - Improved interaction between students
 - Improved student engagement
 - Teachers enjoyed the using the materials
 - Materials were easy to adapt to a variety of grade levels
 - Teachers immediately wanted to make more!

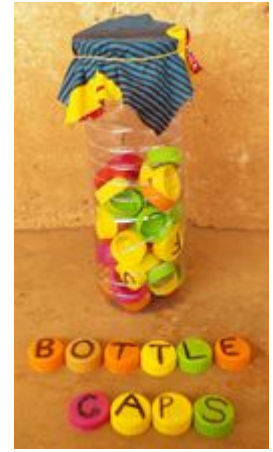


Sustainability and Build Session

- Sustainability
 - Used locally available materials
 - Created a mutual exchange of knowledge and long-lasting partnerships
- Build Session
 - Tutorials for building the new tools
 - Share new methods
 - Utilized local methods
 - Teachers confidently created multiples of tools
 - Began collecting bottle caps and cardboard



Final Products



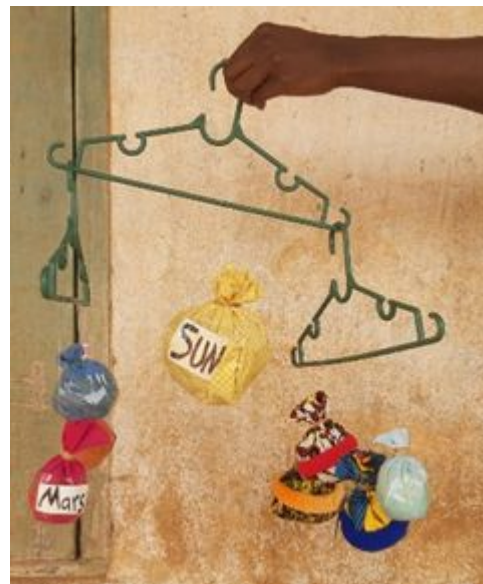
Millions	Hundred Thousands	Ten Thousands	Thousands	Hundreds	Tens	Ones	Decimal Point	Tenths	Hundredths	Thousandths	Ten-thousandths	Hundred-thousandths	Millionths
					3	2	1	•	5	6			



And More!



1									
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Millions	
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Tens	2
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