Building Together

A Child Participatory Prototyping Guide for Rural School Environments in Kenya and Beyond

Anjuli Lara Deborah Grüschow
Spring Term 2025

Chalmers University of Technology
Department of Architecture and Civil Engineering

Examiner: Liane Thuvander
Supervisor: Marli Swanepoel
Co-Supervisor: Bri Gauger

Building Together
A Child Participatory Prototyping Guide for
Under-Resourced School Environments
in Kenya and beyond

Anjuli Lara Deborah Grüschow
Master's Thesis at Chalmers School of Architecture
Department of Architecture and Civil Engineering
Master's Programme of Architecture and Planning Beyond Sustainability [MPDSD]

Chalmers University of Technology
41296 Gothenburg, Sweden
Tel : + 46 (0) 31 - 772 10 00
Examiner : Liane Thuvander
Supervisor : Marli Swanepoel
Co-Supervisor: Bri Gauger

© Anjuli Grüschow
All used Images, Graphics, Photos and Plans in this thesis are created and owned by the author and the learners from the Awelo Workshops unless stated otherwise. No part of this work may be reproduced or used without explicit written permission from the author.

Figure 1 Frontpage

Thank You
Asante Sana
Ero Kamano

To Awelo Primary School

To the learners from 7th Grade at Awelo Primary School,
thank you for your curiosity, creativity, and courage.
You have been the heart of this thesis.

To Benta Wanga, Teacher at Awelo Primary,
thank you for your trust, insights and support on site.

To Joshua Wanga,
thank you for being my guiding connection between Kenya and Sweden,
and for your help with navigating approvals and clearances.

To my Friend Eric Otieno,
thank you for driving me across Siaya, helping me collect materials,
and supporting every part of the workshop process with care and good spirit.

To my Friends and Family,
thank you for standing by my side through every step of this journey.

To Liane Thuvander,
thank you for your thoughtful feedback, clarity, and kind support.

To Marli Swanepoel,
thank you for your steady guidance and encouragement throughout this process.

To Bri Gauger,
thank you for your thoughtful input and kind support.

To the Chalmers Global Mentorship Program & Frank Zingaropoli
I am grateful to the Global Mentorship Program for providing the means for this amazing academic journal in Kenya. Thank you, Frank Zingaropoli, for your guidance and thoughtful support throughout this journey.

Students Background

Figure 2 Anjuli

Anjuli Lara Deborah Grüschow

2023-2025
Chalmers University of Technology
M.Sc. Architecture and Planning Beyond Sustainability

2022-2023
Willen Associates
B.Sc. Architect

2019-2022
Darmstadt University of Technology
B.Sc. Architecture

2016-2019
Resch Innenausbau
Apprenticeship as an interior Carpenter

Abstract

This thesis investigated how including students as active collaborators in the design and construction of their learning spaces through Child Participatory Prototyping could enhance educational environments in contexts with limited resources. Working in an under-resourced context means that key resources like materials, infrastructure, and funding are limited. The case study was Awelo School in Siaya, Kenya. The research investigated how the involvement of children in design processes can foster a sense of ownership, resulting in practical, low-cost improvements that aligned with the children‘s needs.

The study responded to key problems expressed by the students, particular issues such as dust, a lack of seating on the school compound, under-resourced outdoor spaces, and inadequate climate-responsive architecture. Public school architecture being built by the Ministry of Education often continues to use colonial-era design templates, which have been adapted over time primarily for cost-efficancy rather then educational or climate improvement.

While national initiatives such as Vision 2030 and the Competency-Based Curriculum (CBC) emphasized education reform, the design and maintenance of school facilities were largely overlooked. This research addressed the gap by exploring affordable, context-sensitive solutions that relied on local and recycled materials.

The study used a hands-on, child-participatory approach, moving from exploration to co-design, prototyping, and implementation. Through a series of workshops, the students shared their ideas through prototypes, drawings, models, and practical material testing, thereby contributing to the design process. The insights from this process informed the creation of a practical guide, while the Child Participatory Prototyping Tool Sheet is offering strategies and considerations for similar school contexts.

The study examined how child-participatory approaches enabled students to interact with their environment and collaborate to create solutions that improved sustainability and usability.
The guide aims to support future practitioners and suggests that participatory prototyping can complement broader educational reforms.

Keywords

Child-Centered Design, Participatory Prototyping, Under-Resourced School Environments, Local Materials

„Education is the key to unlocking the potential in every individual“
~Mwai Kibaki third president of Kenya

„We would like to sit in a clean, safe and quiet spaces.”
~ Learners from the 7th grade Awelo Primary School

Glossary

Awelo Primary and Junior Secondary School
With the new CBC, the school turned from Awelo Primary School into Awelo Primary and Junior Secondary School. This is due to separating 7th-9th from the primary part and calling it Junior Secondary school. In this thesis I will refer to the school as Awelo School for simplification.

Child Participatory Design
Child Participatory Design is a collaborative design approach that involves children in the design process. It aims to create designs that better meet the needs and expectations of children by applying their knowledge, ideas, and experiences. In this thesis, Child Participatory Design is one of the central methodologies used to engage students in design processes.

Co-Design
Co-Designing is a form of participatory design, where people are actively involved in envisioning and creating solutions that meet their challenges. It is used as a collaborative design method in which designers and users work together as a team to develop solutions. For this thesis, Co-Designing is used as a term that describes the teamwork between the researcher and the students in the second phase of the workshops, where ideas are being developed.

Competency-Based Curriculum (CBC)
Kenya’s new education framework was introduced by the Ministry of Education. The new framework incorporates a greater emphasis on creativity, critical thinking, and practical skills. The CBC creates the foundation for this thesis work that includes hands-on, problem-solving activities like design and prototyping that align with the new curriculum.

Exploration
Exploration is a form of participatory design, where the focus lies on building trust and getting to know each other through observation, conversation, and drawing. It is a time in the process where the researcher is watching and listening and trying to understand the participants‘ realities. Exploration sets the foundation for meaningful participation by creating an atmosphere of mutual respect and curiosity.

Harambee Schools
Harambee Schools are part of the Harambee movement. Harambee means self-help in Kiswahili. Starting with the independence of Kenya, more school buildings were needed fast, and the government resources were low. So the government encouraged communities, parents, and teachers to build schools by themselves. The thesis builds on this example from the past by showing that a lot can be done through participation.

Learners
At Awelo School, the word learner is used instead of pupils or students. In the context of this thesis, the word is used to make a clear distinction between the general student and the selected group of 7th-grade learners who actively participated in the workshops as part of the research process.

Postcolonialism
Postcolonialism refers to the ongoing effects of colonial history on present-day structures, systems, and ways of thinking. In this thesis, it is used as a critical lens to examine how educational institutions, spatial design, and participation practices in Kenya are shaped by inherited colonial models. Postcolonial critique challenges these patterns by emphasizing local knowledge, cultural specificity, and lived experience as valid foundations for design. It also highlights how power, voice, and authority must be reconsidered when working with children in contexts where participation has not been historically encouraged.

Prototyping
Prototyping is a progressive process of quickly building a simplified version of a product or system to test ideas, gather feedback, and refine the final solution. Prototyping is done before the development of a product to get clear solutions to improve the product. In this thesis, Prototyping is used as a practical design method in workshops, where ideas and thoughts of the participants are translated into built designs.

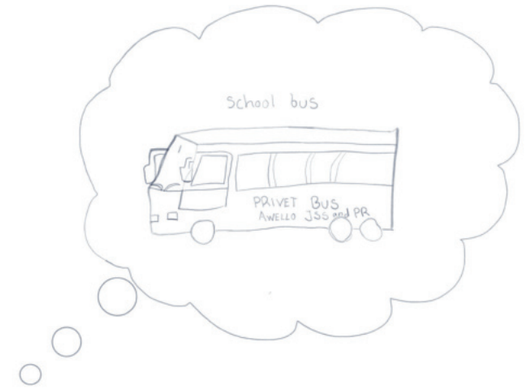
School Environment
The school environment is a connection between a social, learning, cultural, psychological, and physical environment. While this thesis mostly focuses on the physical qualities of outdoor spaces within the school compound, it also acknowledges the impact that these spaces have on the social interactions, sense of belonging, and well-being of the students.

Under-Resourced School Environments
An under-resourced School Enviroment means that key resources like material, infrastructure, and funding are limited.

Voices from the Schoolyard

This is a story told by the learners I have worked with, telling us the story of the everyday life of most of the students at Awelo School. Even though Wesley is a fictional character, the thoughts and story that are told are thoughts of the learners addressed in a story they wrote for me about their school day or from conversations I had with teachers on site.

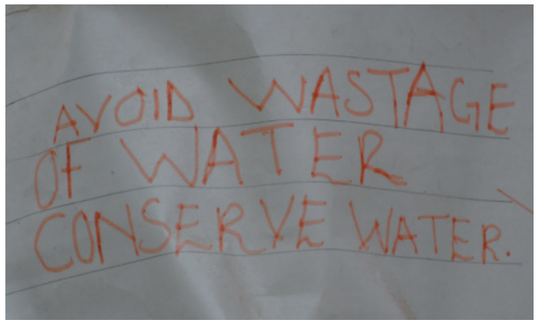
Wesley is a 15-year-old boy. He lives in Siaya County. Every morning he wakes up as early as the bird catches the worm, around 4am, wakes his 4-year-old brother, and prepares them both as fast as the storm. “It is true that early to bed and early to rise makes a person healthy, wealthy, and wise.” Wesley says to himself every morning, and they start walking to school. Both of the boys go to Awelo School, and every day they walk for two hours to get to the school. Every time a school bus passes them, it makes them sad, and they wish they would get picked up by a bus too.



When they arrive at school, they are already 5 minutes late, and they rush into the classes with the rest of the learners, producing a lot of dust, which makes the teachers angry. “No running on the pathways,” they scream by covering their faces with their handkerchiefs. Wesley hears one of the teachers saying to the other, “If at least the classrooms would be protected from this dust. It makes me sad to see some learners smashing the windows.”

He makes it into 7th grade just in time before the teacher starts with his creative arts lesson, where they mostly draw because there are no more supplies than paper and pencils at the school. After creative arts, it is time for sports. Wesley likes to have sports in the morning when it is still a bit cooler; it is easier to run. Now it is time for pre-technical class, where Wesley learns about technical drawing and simple measurement techniques.

After the first classes, it is time for a break. Wesley walks over to the water tap to refill his water bottle, where he notices a new sign on a tree. It says:



But the queue is long, and all learners are pushing to get to the water, and water spills. A large puddle forms in a very short time, and the water has nowhere to go. Whoever wrote that sign is right, Wesley thinks, but there is nothing that can be done to stop this. There are just too many children pushing and joking around, not paying attention to the water spilling.

After Wesley is finally able to fill his water bottle he runs to the end of the school compound to play football with his friends.

When the break is over, it is time for English and Kiswahili. Wesley prefers the English class even though it is harder for him. “When I am older I am going to study at an University of a different country. So I have to really pay attention to the teacher in class.” He thinks to himself and sits down in the first row. But the class is loud and the words of the teacher echo in the classroom, so it is really hard to follow.

In the second break it is time to have a little snack and some tea. Wesleys friend asks him: „Unataka kushiriki embe niliyebeba?“ (Do you want to share the mango I carried?) So they share the fruit.

Time for Mathematics and Agriculture, Wesleys least favorite subjects. He can‘t wait until it‘s lunchtime. What is the point of doing agriculture during the dry season when they are not allowed to use water to water the plants? Nothing grows and everything dries out. He thinks to himself.

Lunchtime. Finally! Wesley leaves the classroom and picks up his brother from Pre Primary class 1 and they both get in line at the school‘s kitchen to get their lunch. It smells like fire and Wesley looks a bit afraid at the wooden building the food is prepared in··· Is it getting darker? Will it burn down?

It is their turn and they get the smallest portion available. One serving of ugali for 30KES. Other people stay hungry at lunch time. “I wish that if there would be a person who can help them and provide them food and other resources.” He thinks to himself.

He and his brother sit down in the shades on the ground and enjoy their lunch. Wesley wants to play football with his friends again. His little brother is sad he wants to play football too but he is too young Wesley says. So he sits down next to the field and watches his brother play. If they would only have swings or some other things to play with he thinks.

Figure 3-11 Voices from the Schoolyard

After the lunch break it is so hot and dusty in the classroom that Wesley‘s Social studies teacher decides to take the lesson outside. They find a space in the shades with a nice breeze and the class starts.
Following the class has integrated since followed by game time.

In the afternoon class the Athletic team of the school is meeting on the football field but Wesly goes to a tutoring class to better his best in English, as they say here in school. But they are also allowed to read some of their own books and Wesley loves to read his only storybook he owns, about the war against Taka Taka over and over again. (Taka Taka means Waste and Garbage in Kiswahili. The book is a children‘s book that addresses environmental issues, particularly waste management.)

After his tutoring it is time to go home for everyone. But Wesley sits down in the dust for another 30 min to do his homework. When he gets home he has to help his mother on the farm leaving no time for his homework.

Table of Contents

Positioning

Figure 12 Positioning

Introduction

Educational environments significantly impact students‘ learning experiences; nevertheless, many schools in under-resourced regions, like Kenya, face inadequate infrastructures and poorly designed outdoor spaces. (Republic of Kenya, 2020; Onyango, 2020). This is particularly evident in Siaya, a rural area in western Kenya near Lake Victoria, where schools face both spatial and financial constraints.

This thesis builds on fieldwork with the masters course Reality Studio 2024, a hands-on collaboration that formerly worked with Awelo School in Siaya Kenya (Chalmers University of Technology, 2024). The gained experience working with RS24 led to a more grounded approach, informed by existing relationships, observations, and workshops.

The challenge for the schools to keep up with adding and maintaining the school infrastructure was even made harder through the new reforms like the Vision 2030 and the Competency-Based Curriculum (CBC). Through changing the curriculum, even more infrastructure and buildings like laboratories and workshops are needed while schools still try to get funding for enough classrooms for all their students.

To keep classrooms cost-efficient, they were often drawn from colonial-era templates that were only slightly adjusted but still don‘t meet the local climate, the size of the classes, and acoustic solutions, leading to overheating, dust problems, inadequate light conditions, and acoustic problems.

Outdoor spaces remain underdeveloped, despite their potential for improvement to support well-being and social, physical, cognitive, and emotional development.

This thesis is based in Awelo Primary and Junior Secondary School in Siaya and was shaped through the collaboration with learners in the form of Child Participatory Design. It was further informed by the participatory design tool sheets developed by Architects Without Borders, which offered a useful foundation but lacked guidance for full-scale prototyping in under-resourced school settings. In this process, students actively identified issues, co-designed solutions, and prototyped. By implementing hands-on, low-cost solutions tailored to learners‘ needs, this research seeks to demonstrate how small-scale, locally driven interventions can lead to meaningful improvements in school environments.

The outcomes of this process informed the creation of the Child Participatory Prototyping Guide and Tool Sheet, a practical guide for others working in similar under-resourced school contexts.

Research Focus

Aim

The aim of this thesis is to investigate how including children as active collaborators in the design and building of their learning spaces can enhance outdoor school environments in Kenya. This research focuses on the use of Child Participatory Design combined with Prototyping in an under-resourced context. The thesis also reflects critically on the challenges of designing in postcolonial settings, respecting local structures of authority, and giving time to the children to warm up to new forms of engagement.

By engaging 7th-grade students in hands-on workshops, the thesis investigates how student-led processes can inform low-cost, sustainable, and locally appropriate design solutions. The goal is to strengthen students’ sense of ownership while critically examining limitations of current school infrastructure.

Besides this, the thesis also aims to develop a practical guide on Child Participatory Prototyping that shares methods and insights from the process, offering guidance for other researchers working in similar contexts. The aim of that guide is to close a gap in child-centered design that includes more hands-on, building together approaches with prototyping as a focus.

This approach also aligns with broader shifts in Kenyan education, such as the Competency-Based Curriculum (CBC), which emphasizes creativity, hands-on learning, and the integration of local knowledge as well as practical skills.

While not centered on indigenous traditions specifically, this thesis builds on those ambitions by working with local people and materials to explore grounded, student-driven design solutions.

Purpose

The purpose of this thesis is to identify how Child Participatory Prototyping can be applied in the context of under-resourced schools in Kenya to enhance the usability, comfort, and emotional connection students have with their school environment. Through student-identified concerns, the project explores how prototyping processes and local materials can be used to create more functional, inclusive, and engaging outdoor spaces while also supporting a sense of ownership and agency among the learners.

Furthermore, this thesis includes the development of a practically oriented guide and tool sheet intended to support other researchers in integrating children into prototyping processes. The guide and tool sheet are based on findings from the workshop process and offers critical reflections on the challenges of participatory design in postcolonial, low-resource settings. It also aligns with broader educational values promoted by the Competency-Based Curriculum (CBC), such as creativity, hands-on learning, and the integration of local knowledge.

Research Questions

How can Child Participatory Design methods be translated into a practical Prototyping guide for improving school environments in low-resource contexts?

How do learners and teachers perceive and experience their school environment, and what becomes visible through observation?

What materials, methods, and conditions support safe, inclusive, and locally grounded prototyping with children?

Figure 13 Approaching

Theoretical Framework

This thesis brings together postcolonial critique, child participatory design, and prototyping as an integrated framework to guide both the methodology and ethical positioning. These three lenses shape the research approach and help respond to the question of how to design with children in under-resourced school environments in a meaningful, respectful, and locally grounded way.

Colonialism in Kenya and other parts of Africa was not simply a historical phase. It impacts structures of social relations, educational models, and the built environment to this day. The colonial rule operated through systems of indirect governance, land dispossession, and cultural domination, overlooking African knowledge systems, identities, and spatial practices. This led to the development of school systems shaped by European models and authority, often disconnected from local ways of learning and being. Even after independence, these patterns persist in the architecture, routines, and pedagogical values of many educational institutions (Olweny, 2023; Lonsdale & Berman, 1979; Uduku, 2018; Adebisi, 2016). In response, postcolonial critique challenges not only institutional structures but also inherited assumptions about childhood, space, and participation. It calls for the centering of local knowledge, cultural specificity, and lived experience as valid starting points for research and design (Parashar & Schulz, 2021; Blanchet-Cohen, Jorgensen, & Cohen Mitchell, 2023; Tuhiwai Smith, 2012).

This has a direct impact on how child participation is framed in the thesis. Participation is not neutral. Especially in postcolonial contexts, including children in decision-making requires sensitivity to power, history, and voice. While the United Nation Convention on the Rights of the Children (CRC) recognizes children as independent rights holders, particularly with the right to be heard in decisions affecting them, participation remains uneven in practice. (Duramy & Gal, 2020). In school environments where respect for authority is culturally emphasized, children are often discouraged from expressing their views. Participatory design is one response to this, offering a framework for redefining children's roles as contributors to shaping their environments (Duramy & Gal, 2020; Tangen, 2008). Participation is strengthened when democratic and emancipatory values guide the process and when decision-making is shared between children and adults, fostering mutual learning (Van Mechelen et al., 2019).

There are several models that attempt to conceptualize the different levels of participation. The first one of these frameworks is Arnstein's Ladder of Citizen Participation from 1969, which differentiates between non-participation, tokenism, and genuine citizen power.
Although this model remains foundational, it has been criticized for its linear and hierarchical structure (Collins & Ison, 2009). Harry Shier's alternative framework, for example, is based on five types of child participation, ranging from listening to children and supporting them in expressing their views to involving them in shared decision-making processes and ultimately sharing responsibility and power (Duramy & Gal, 2020). These models inform the methodological decisions in this thesis, especially in how children were engaged not only to speak but to actively shape outcomes.

Creative tools such as drawing, storytelling, and modeling further support participation in settings where children may not be used to verbal reflection or dialogue. These tools open up other ways of expression, making space for children to show what they imagine, what matters to them, and what they need. Previous research shows that such methods not only deepen engagement but also allow children to take on more active roles in the design process (Tangen, 2008; Iversen, Smith, & Dindler, 2017). Rather than relying solely on verbal participation, this thesis combines creative exploration with hands-on making, reflecting Shier's vision of children not only being heard but actively shaping outcomes.

Prototyping plays a key role in this thesis. Traditionally used to test and refine design ideas, prototyping also creates a space where children can see their ideas take shape, test their own ideas, and adapt in real time. Especially in educational and low-tech contexts, prototyping can be a powerful method for reducing abstraction and enhancing engagement (Budde, Kautz, Kuhlenkamp, & Züllighoven, 1992). Using familiar and locally available materials like clay, sticks, or wood not only lowers barriers to participation but also reinforces the children's agency. Rather than designing for them, the process becomes about designing with them, using what is already present and known. Research has shown that this kind of hands-on engagement increases motivation, strengthens ownership, and results in outcomes more aligned with users' lived realities (Kirjavainen, Nousiainen, & Kankaanranta, 2005).

In this thesis, Child Participatory Prototyping emerges as a synthesis of these ideas. It is not just about including children in decisions but about supporting them in becoming co-creators of the spaces they inhabit. Situated in a postcolonial context and developed in direct response to the constraints and opportunities of an under-resourced school environment, this approach values local knowledge, creative practice, and iterative design. In this process, Child Participatory Prototyping offers a hands-on approach that gives children space to express, test, and build their ideas, making participation visible and real.

Research Approaches

Methodology

This thesis uses the Mixed Methods Approach with a focus on the qualitative perspective. This approach merges the research on observations, drawings, interviews, and co-design sessions and uses quantitative tools like mapping student numbers or workshop participation to support certain design decisions. (Creswell, 2018).

Additionally, the thesis is grounded on the Social Constructivist Worldview, which is an approach that is used in qualitative research. This worldview seeks to understand the world and human interaction in cultural and social contexts (Creswell, 2018). The research focuses on the lived experiences, perspectives, and ideas of the learners at Awelo School rather than seeking objective or universal views. In this thesis, the goal of the research is to rely on the participants‘ views by leading the questions and workshops but leaving enough space for their thoughts and ideas without forcing answers on them. This worldview is also aligned with the thesis's theoretical grounding in postcolonial critique, which calls for an emphasis on local knowledge and everyday experience as valid starting points for research, especially in contexts where dominant systems have historically devalued them.

Furthermore, the thesis engages with children by using Participatory Design. This methodological choice is rooted in the thesis's broader aim to challenge inherited power structures and give children a meaningful role in shaping their environments. The goal of this approach is to design with the users of a space rather than for them. By giving students the space for their ideas, experiences, and needs, the project is tailored to the specific needs of the school. Therefore, Participatory Design is a suitable methodology for this thesis, working with collaboration and inclusivity in an under-resourced school environment, giving students the possibility to share their insights and needs from their perspective. This project implements Child Participatory Design by conducting a series of hands-on workshops with 7th-graders at Awelo School. Participatory Design, in this thesis, is used not only as a methodological tool but also as a response to postcolonial conditions, where participation is historically uneven and shaped by power dynamics (Duramy & Gal, 2020; Tangen, 2008). It builds on the idea that participation should go beyond tokenism, offering children real influence in shaping their environments (Van Mechelen et al., 2019).

By using Participatory Design, this thesis fosters a more inclusive and context-sensitive approach to improving school environments. It ensures that students are not just consulted but actively shape their environment, strengthening their sense of ownership and allowing their voices to be present in shaping a more relevant and meaningful school space.

Methods

Workshops

Conducting workshops offers valuable insights into students‘ perspectives on school design and infrastructure. These sessions foster active participation, allowing participants to voice their needs, ideas, and concerns. The goal is to create a more inclusive learning environment by aligning the design with the community's specific educational and cultural needs, encouraging ownership and collaboration in the process (Martin & Hanington, 2012). Workshops were chosen as the main format because they offer a flexible and interactive structure that supports both creativity and collaboration—essential elements for participatory work with children.

The workshops were structured into three key phases:

Exploration

The first phase was Exploration, in which the students showed their concerns and hopes for the school through drawing. This phase was also used to get to know each other and gain insights into the students‘ lived experiences. “Dreaming Through Drawing” is a participatory design method that formed the idea for this phase. In this method, participants sketch their ideal space and discuss their choices with a facilitator (Architecture Sans Frontières UK, 2014-a). Drawing was used as an entry point in workshop 1 because it lowers the barrier for participation, especially for children who may not yet feel comfortable expressing ideas verbally.

Co-Designing

In the second phase, the focus shifted over to Co-Designing where the students visualized their ideas in the form of models. These models reflected their ideas for outdoor seating areas and shaded zones, spaces that support not only physical activity but also social interaction and learning beyond the classroom. “Dreaming Through Modeling” is a participatory design method that formed the idea for this phase. In this method, spatial preferences are explored through hands-on three-dimensional model making. Rather than aiming for technical precision, the focus lies in the flexible and iterative nature of modeling, allowing participants to test, rearrange, and discuss the spatial composition (Architecture Sans Frontières UK, 2014-b). Model making was introduced inn workshop 2, to move from abstract ideas to three-dimensional forms, helping students engage spatially and physically with their visions.

Prototyping

The third phase focused on Prototyping spatial and material solutions for the schoolyard, based on ideas developed in earlier workshops.
Prototyping involves creating a preliminary version of a design to test concepts and gather feedback (Martin & Hanington, 2012). In the context of school projects like Awelo School in Kenya, prototyping allows architects, teachers, and students to visualize and refine school designs, incorporating sustainable materials and local input.
Another part of Prototyping is Material Testing. Material testing can be understood as a method that supports hands-on exploration and dialogue between participants, designers, and materials. It allows ideas to be tested in real time and grounded in the physical context of the project. (Hansen, 2017). This thesis tested the durability of specific materials as ground-covering solutions against dust and mud.
Students co-created prototypes through hands-on testing of materials and prototypes, such as playthings and seating elements, using locally available and recycled resources. The goal was to explore functionality, durability, and feasibility for implementation on-site. Prototyping was used in Workshop 3-6 to translate student ideas into real, testable interventions, allowing them to evaluate and adjust their own designs through direct experience.

Each workshop step built on the previous one, ensuring that student voices actively shaped design decisions, aligning with Child Participatory Design principles.

Participant Observation

Participant Observation helps understanding and learning about the activities of people in their natural environment (Kawulich, 2005).
Walking and Talking involves conducting interviews while walking with participants through relevant environments, allowing discussions to be grounded in the physical context and prompting reflections tied to specific places (Architecture Sans Frontières UK, 2014-c).

In this thesis, Participant Observation was used by spending a lot of time on site, observing everyday life, and talking to students and teachers. The walk-and-talk with a teacher was also used to receive input from an adult perspective and see where their priorities lie in comparison to the students. This method was chosen to allow insights to emerge naturally through quiet presence and attention to the school's everyday rhythms, without disrupting or directing them.

Photo Studies

Photo studies are a visual research method that helps document the existing conditions. Besides that, it also captures light, texture, materiality, and ambiance. It can also be used to document a site over time when pictures are taken before and after something has been implemented (Martin & Hanington, 2012). In this research, Photo Studies were used to document the current state of the school, different steps and phases of the workshops, and a before-and-after documentation. It is an addition to the written parts of the thesis to help foster an understanding of what this thesis has worked with and was conducted throughout the whole process.

Directed Storytelling

Directed Storytelling is a method that is used to gather stories of lived experiences from participants by thoughtfully creating questions (Martin & Hanington, 2012). In this thesis the method was used through a voluntary homework given to the learners at Awelo School, where they were asked to narrate their favorite school day in written form. The prompts guided them through their daily routines, from waking up to lessons, meals, breaks, and afternoon activities. This method allowed students to share their experiences in their voice and preferred language, producing detailed, reflective narratives. It was chosen because it enabled learners to express themselves privately and comfortably, avoiding the pressures of direct questioning while still capturing rich personal insights.

Persona

Personas are fictional but research-based characters that represent real user behavior, needs, and challenges (Martin & Hanington, 2012). In this thesis, the persona method will be used as a qualitative narrative tool to introduce the reader to the lived realities of learners at Awelo School. The Persona is developed from real-life stories shared by the learners. The persona was used to give voice to the learners' collective experiences in a way that protects anonymity while bringing emotional clarity to the research findings.

Ethical Considerations

Given the Child Participatory nature of this research, it was crucial, as required by ethical and legal standards, to provide every legal guardian of each child with a consent form (see Appendix B). The consent form clearly explains the voluntary nature of involvement, data usage, and anonymity. The students' names were anonymized, and all images or quotes were used with prior permission. The workshops were designed to be respectful, inclusive, and empowering for the learners, ensuring that their input was valued and safe spaces were maintained throughout.

In addition to that, an ethical clearance from the Ministry of Education granting the work on-site was needed, allowing the work with a Kenyan school (see Appendix C).

Besides that, the school community, including students, teachers, and facilitators, was informed about the scope of the project.

Scope and Boundaries

Figure 14 Delimitations

This diagram is showing what the thesis is about and what it is not about. To make it easier to understand the delimitations, this diagram is divided into five topics: Sustainability, Design and Building, Culture, Social and Education.

To these topics there are connected sub- topics that are either in a circle that is filled with color, meaning that it plays a role in the thesis or in a circle that has a dashed line, meaning it will be excluded in this work.

Process Timeline

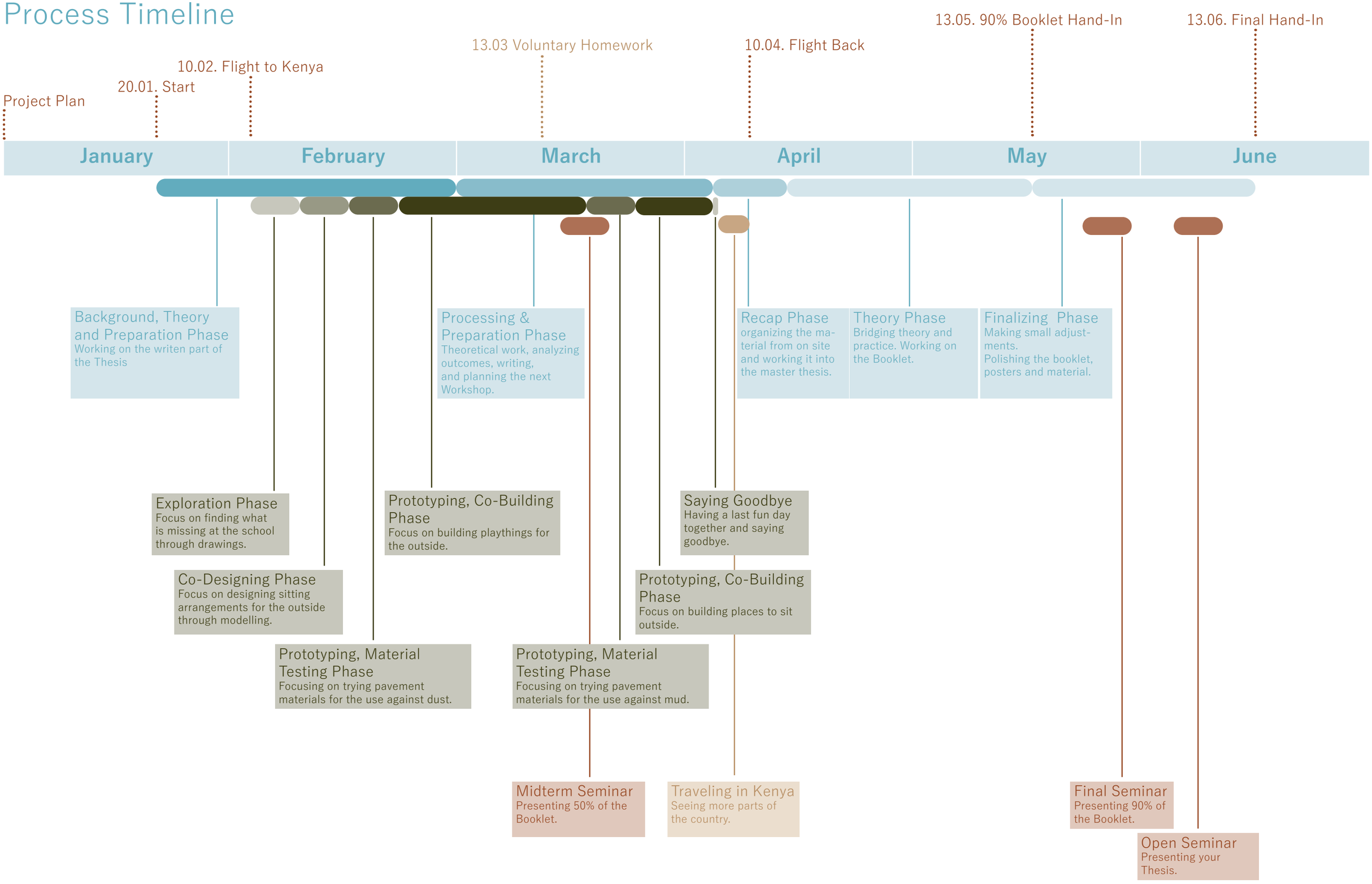


Figure 15 Timeline

Background and Context

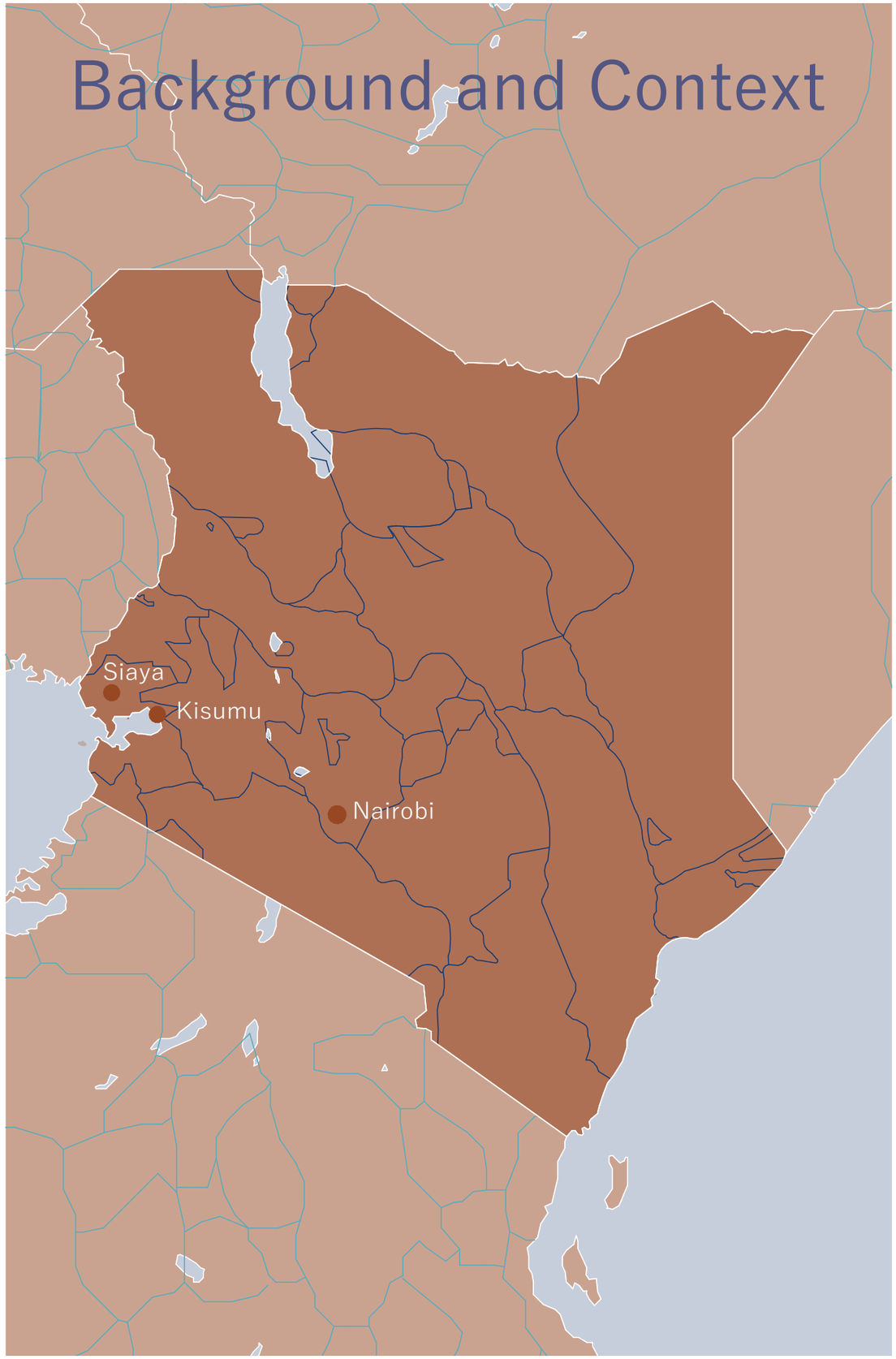
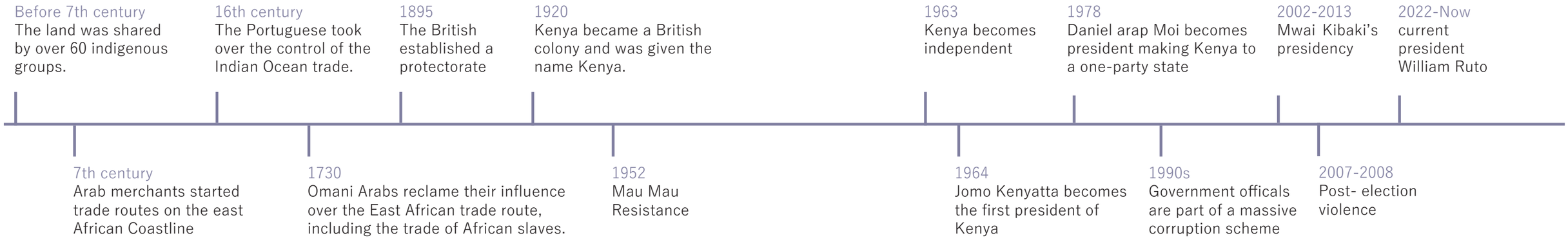
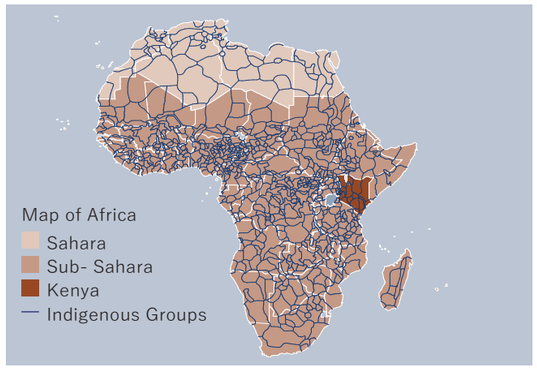


Figure 16 Context

A brief History of Kenya



Over a hundred years ago the land of what we now know as Kenya did not exist (Kiiru, 2004). The land was divided and shared by over 60 different indigenous groups (Cole, 2023). In the 7th century, the Arab merchants started trade routes on the east African coastline, establishing trading points (Black History Month, n.d.) and introducing the Islamic faith to the African population. The Swahili culture developed through the exchange between Bantu people and Arabian merchants (Aboh et al., 2019).



In the 16th century, the Portuguese aimed to control the lucrative Indian Ocean trade routes to monopolize the spice trade and access other valuable goods such as gold and ivory (Pradines, 2016). The Portuguese disrupted local trade networks along the Kenyan coast, which were previously dominated by Swahili and Arab merchants, and influenced the Swahili and Oman architecture style (Pradines, 2016).

In 1730, the Omani Arabs sought to reclaim and expand their influence over the East African trade routes, including slaves in their trades.

With the trade of ivory from the inland of Kenya and the growth of clove plantations in Zanzibar, the need for slaves grew, coming to a peak in the 1860s when Zanzibar alone was absorbing about 10.000 slaves per year. This led to forced migration and displacement of thousands of people, disrupting traditional family and community structures (Okorn et al., 2020).

In the late 19th century, European colonial interest in East Africa intensified. In 1895 the British gained control over regions previously influenced by the Omanis, leading to the establishment of a protectorate over the land and bringing an end to the slave trade. While the Kikuyu and Luhya (indigenous groups) cooperated with the British, the Nandi showed resistance. This resistance was brought down when the British killed their leader during a supposed truce meeting.

Nairobi was established as the capital in 1899, and in 1920 the Protectorate became a British colony and was given the name Kenya (Parsons, 2010, pp. 289-311).

According to the World Atlas, the name Kenya comes from Mount Kenya in Kikuyu, originally Kirinyaga („mountain of whiteness“ due to the snow on the peak) , the highest mountain in Kenya. The word Kenya is most likely a misinterpretation of its original name by a German explorer in 1849 (World Atlas, n.d.).

With the colonization, British settlers arrived and dispossessed Africans from their land. That led to hundreds of thousands of Africans living in poor conditions, with few opportunities for employment (Newsinger, 1981).

In 1952 a group of Kikuyu, the largest indigenous group in Kenya , decided to build an armed resistance against British rule, called the Mau Mau, with Jomo Kenyatta as a key political figure advocating for independence. The response of the colonial government was harsh, putting effort towards eliminating the Mau Mau threat. Many Kikuyu were deported to reserves or concentration camps (Berman, 1976). Kenyatta, accused of leading the Mau Mau, was arrested in 1952 and sentenced to prison in 1953. Although Kenyatta remained imprisoned, the resistance continued until the late 1950s (Newsinger, 1981). By 1960, the British recognized the need for political reforms, and Kenyatta was eventually released, paving the way for Kenya's independence (Berman, 1976).

Despite the military defeat of the Mau Mau, it was the first indicator of broad support for independence among the indigenous peoples in Kenya (South African History Online, n.d.).

From 1957, the indigenous peoples were allowed to vote officially for the first time, giving indigenous politicians a bigger platform to push for their rights. Kenya gained full independence on December 12., in 1963 (Encyclopædia Britannica, n.d.), and Jomo Kenyatta (one of the earlier mentioned Kikuyu Mau Mau fighters) became the first president of Kenya in 1964 (Presidential Library of Kenya, n.d.).

The colonial time changed the character of the country forever, even after its independence. Despite some protests, the country decided to take a capitalist, Western-oriented path, which included the adoption of a capitalist economy, reinforcing existing inequalities in land distribution and access to resources, and Kenya inherited segregated urban structures, with informal settlements persisting. The first constitution was made in Britain and not by Kenyans themselves, stopping Kenya from fully developing its own national identity or confidence as a country. This led to underdeveloped infrastructure because of a continuation of reliance on foreign aid from Western countries.

Kenya was at a crucial point where it had to find its own constitution for a country that includes numerous languages, cultures, ethnicities, religions, and indigenous groups that the British bound together into one nation. To shape and unify the different linguistic and indigenous groups of the nation, English and Kiswahili were intentionally promoted, especially in education, government and administration, and media and communication. The two languages occupy such a big central place in the education system that in order to pass exams, you need to speak them fluently. This limits the role of the other around 70 indigenous languages until today (Kiiru, 2004).

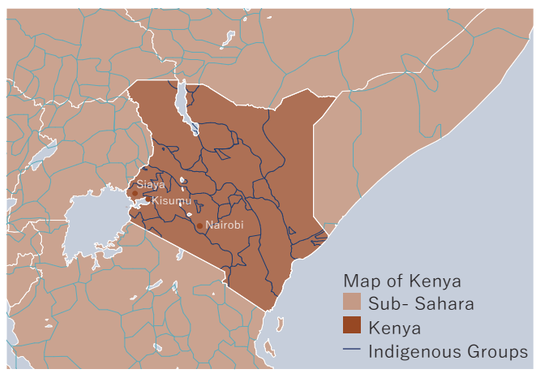


Figure 17-19 History

Education in the Context of Kenya

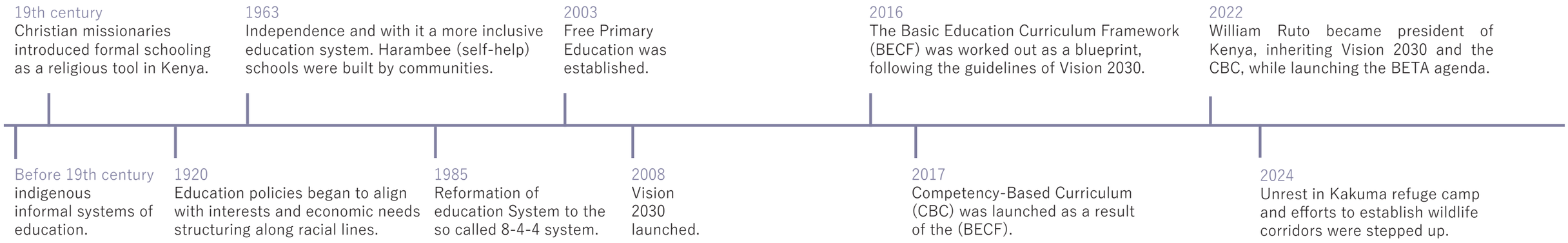


Figure 20 Education

Education is one of the most important tools for the development process of any nation. (Mackatiani et al., 2016) In Kenya, however, the education system, along with the national character, was inherited from Britain. The education in Kenya can be traced back to the 19th century, when Christian missionaries introduced formal schooling as a tool for religious conversion. (Nyamwange, 2020)

Before the arrival of missionaries, indigenous communities across Kenya practiced informal but highly structured systems of education. Children learned through observation, storytelling, songs, and participation in daily work, with elders and community members guiding them in acquiring knowledge, skills, values, and moral codes essential to communal life (Maangi, 2024).

In 1920, with the colonial government in power, the education policies began to align with its own interests to serve its administrative and economic needs, structuring it along racial lines. African, Indian, and European students were segregated and trained according to colonial priorities, leaving Africans with vocational and technical training to create a workforce that would support the colonial economy.

Following independence in 1963, Kenya strived for a more inclusive education system that would unify and help the development of the country, emphasizing the expansion of primary and secondary education and encouraging community-driven efforts to build schools (Mackatiani et al., 2016). The concept is called Harambee (self-help) schools, and it was a major initiative where local communities mobilized resources to establish schools. This model played an important role in the development of Kenya‘s primary education, especially in rural areas (Corrado, 2022). Nevertheless, these schools often struggled with unqualified staff, inadequate facilities, and a lack of teaching materials. This led to an inequality between Harambee-led schools and government-led schools. Later the government started to regulate and support Harambee schools by incorporating them into national education planning (Inyega et al., 2021).

In 1985 the education system was reformed, leading to eight years of primary education, four years of secondary education, and four years of university programs.

The Kenyan government implemented Free Primary Education in 2003, a policy aimed at increasing literacy levels. This initiative boosted the enrollment of students but also strained the available resources, leading to overcrowded classrooms and a shortage of teachers. Post-independence efforts in general saw a shift towards rapid expansion rather than quality improvement, leading to one kind of structure in school designs across Kenya (Mackatiani et al., 2016). These designs often developed from colonial-era models that emphasized functionality and cost-efficiency but were poorly adapted to local climates, the size of the classes, and acoustic solutions, leading to overheating, dust problems, inadequate light conditions, and acoustic problems. (Olweny 2023).

In 2008, Kenya‘s Vision 2030 launched. The Vision is a development blueprint that aims to transform the country into a middle-income nation by 2030. It includes 3 pillars: the economic, the social, and the political. This information is important to know, as education is part of the social pillar. It includes the expansion of access to quality education across all levels and strengthening the integration of science, technology, and innovation into the education system (Kenya Vision 2030 Delivery Secretariat, 2022).

In the context of Vision 2030, the Constitution of Kenya 2010 and the East African Community (EAC) worked out a blueprint in 2016 called The Basic Education Curriculum Framework (BECF) (Kenya Institute of Curriculum Development [KICD], 2017). This was translated into a curriculum by The Kenya Institute of Curriculum Development (KICD), including the development of syllabi, learning materials, assessment guidelines, and teacher training programs, all aligned to the BECF‘s competency-based approach (Ministry of Education, 2018).

In 2017 the government introduced the Competency-Based Curriculum (CBC). This new system focuses on creativity, critical thinking, and practical skills (Mackatiani et al., 2016). The CBC focuses on four key skills, called the four C‘s: communication, critical thinking, citizenship, and creativity (Nyamwange, 2020), and is divided into five levels:

Level 1 Pre-primary Education (2 Years)
Level 2 Lower Primary (Grade 1 to Grade 3)
Level 3 Upper Primary (Grade 4 to Grade 6)
Level 4 Lower Secondary (Grade 7 to Grade 9)
Level 5 Senior School (Grade 10 to Grade 12)

Levels 1-4 are included in the primary schools (Teachers Arena, 2022). The difference from the previous system is that the 9th grade is now part of the primary school facilities, facilities that the schools don’t have (Nyamwange, 2020).

Besides that, the CBC requires modern classrooms, smart boards, laboratories, creative centers, and technologies on various levels, infrastructures that were never put in place before the curriculum was rolled out (Nyamwange, 2020).

Numerous education policies were introduced for political gain rather than well-planned educational strategies. Corruption and mismanagement have also affected the implementation of key policies.

For future reforms, the focus must be on policy stability, stakeholder engagement, and aligning education with national and global development goals (Mackatiani et al., 2016).

In 2022, William Ruto was elected president of Kenya. Under his leadership the Bottom-Up Economic Transformation Agenda (BETA) was introduced, aligning with the goals of the Vision 2030 to enhance productivity and ensuring food security, providing support to boost entrepreneurship and job creation, developing affordable housing to improve living conditions, improving access to quality health services, investing in digital infrastructure and promoting the creative industry, excluding education from this agenda. (The National Treasury and Economic Planning, 2024)

Nevertheless, William Ruto was handed over the Vision 2030 and the new CBC when he started his term of office. In his campaign he emphasized economic inclusion for marginalized and low-income Kenyans (Lockwood, 2023). Despite his promises, his administration faced economic struggles and rising debt from citizens who expected immediate relief. Internal political

instability arose when he failed to meet economic expectations (Maiyuria, Mackatiani, & Gakunga, 2024).

The steps that Ruto's administration is taking to further implement the Competency-Based Curriculum (CBC) have faced criticism over resource allocation and execution. Furthermore, parents and teachers argue that the system is expensive and lacks the necessary infrastructure to function effectively (Maiyuria, Mackatiani, & Gakunga, 2024). On top of that, there is critique on the unclearness and vagueness of how the Bottom-Up Economic Transformation Agenda (BETA) is aligning with the CBC.

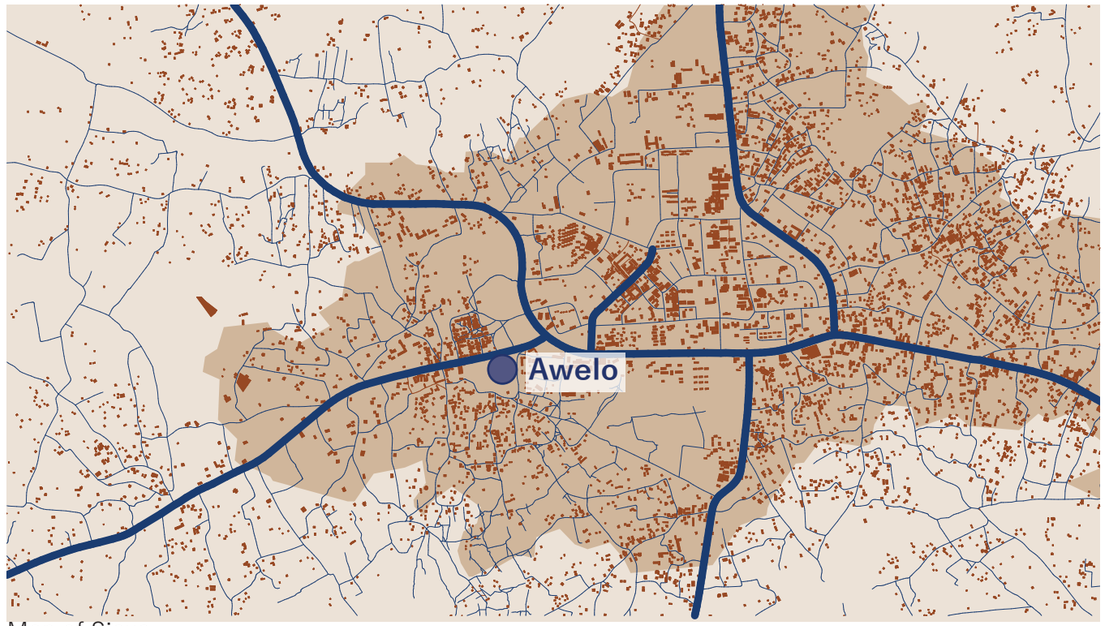
Ruto's administration faces significant challenges in meeting the ambitious goals of the Vision 2030 while managing political tensions (Lockwood, 2023).

Kenya's latest news:

In early March 2025, the Kakuma refugee camp in northern Kenya witnessed significant unrest. Thousands of refugees, primarily from South Sudan, Ethiopia, Burundi, and Congo, protested against severe reductions in food rations (Musambi, 2025).

In March 2025, conservationists in Kenya intensified their advocacy for the establishment of wildlife corridors. These corridors are essential to support the country's recovering animal populations, addressing challenges such as habitat loss and human-wildlife conflicts (Komu, 2025).

Siaya and Awelo



Map of Siaya

Figure 21 Siaya Map

This thesis builds on prior fieldwork conducted during the Reality Studio program in 2024, where an initial partnership with Awelo Primary School and the local community in Siaya was established. That collaboration formed the backbone for the participatory approach and research direction of this thesis.

Siaya town, located in the western part of Kenya, is the capital of Siaya County. The town holds historical and cultural significance, serving as a centre for the Luo community, one of Kenya's largest indigenous groups.

Siaya has a population of approximately 35,000 residents. The primary language spoken in Siaya Town is Dholuo spoken by the Luo community. The primary economic activities in Siaya are agriculture and livestock farming. As the administrative centre of Siaya County, the city also benefits economically from the presence of government offices and educational institutions, which provide employment and drive local commerce (County Government of Siaya, 2018).

There are 23 schools in town of which 15 are primary schools and 8 secondary schools (Siaya Township Location Schools | ShuleZote, n.d.).

Awelo is a district within Siaya. The area is predominantly residential, with local businesses, markets serving the community and Awelo Primary School that this thesis is working with.

Road in front of Awelo School

Traditional Food (wet fried pork with ugali)

Fruit and vegetable stand

Corner of central Siaya

Building Ministry of lands and physical planning

Gas for cooking stoves

People selling their goods on the street

Hardware store with timber yard

Figure 22-29 Siaya

Toward Participatory Prototyping in Architecture with Children

When looking up the word prototyping, it becomes evident that it is a widely cited source. The Cambridge Dictionary states it as „the first example of something, such as a machine or other industrial product, from which all later forms are developed" (Cambridge University Press, n.d.). That does not necessarily fit with architecture or design, but what can be taken from it is that it is a first version of something.

Investigating prototyping further in relation to architecture and design, the definitions start to include more aspects. Camburn et al. (2017), for instance, defines prototyping as follows: „Each prototyping effort requires a certain unique strategy to resolve a design problem or opportunity. This strategy influences the nature of information that can be explored and learned from the prototype" (Camburn et al., 2017, p. 2). Sheil (2012) describes this by stating, „The status of the resulting physical assembly is an architectural prototype, perhaps better identified as protoarchitecture, and the difference between the drawn and the made is a rich territory for collaborative and creative engagement" (Sheil, 2012, p. 22). Burry, on the other hand, defines it as „Prototyping allows architects to engage directly with materials and construction techniques, fostering a deeper understanding of design implications" (Burry & Burry, 2017).

Together, these definitions highlight that in architecture, prototyping is not merely a step in the process; it is a strategic, material, and conceptual practice that bridges thinking and making, allowing designers to explore, test, and engage with design.

When going a step further into the thesis theory on child participatory design, prototyping is used as a tool for expressing thoughts and ideas in early concept testing referred to as low-tech prototyping involving materials like paper, clay, or cardboard (Druin, 2002; Iversen et al., 2010). This kind of prototyping is situated in the co-design phase of a process rather than the actual realization of spatial or material interventions. While there are studies involving children in the design of schools, playgrounds, or public spaces (van Dooren et al., 2014; Bishop & Corkery, 2017), these efforts rarely go beyond involving them in full-scale prototyping. This gap is particularly significant in the context of architecture, where form, scale, materiality, and embodied experience are central to design learning and impact.

In the already earlier mentioned fieldwork conducted during the Reality Studio program in 2024, it became evident that there is little research to be found on full-scale prototyping; most of the research includes low-tech prototyping with children, leaving out the possibility for 1:1 prototyping with children.

This guide builds on the participatory tool sheets by Architects Without Borders (ASF), which focus primarily on identifying needs through participatory methods like 'dreaming through drawing' and 'mapping.' However, they do not offer detailed guidance on full-scale, physical prototyping with children, nor do they address working in resource-constrained or postcolonial school contexts. This guide attempts to fill that gap.

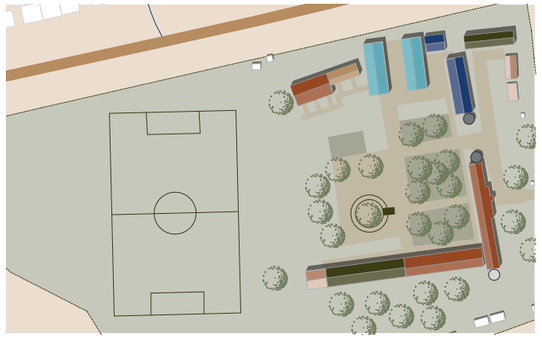
The collaboration with Awelo School in Siaya involved children not only as co-designers in workshops but also as active participants in the prototyping and construction of 1:1 acoustic panels made from locally sourced materials. The experience revealed how direct material engagement allowed for a deeper, more situated form of learning and agency.

Nevertheless, it also exposed a lack of existing tools or academic frameworks for supporting full-scale prototyping with children. This realization further reinforced the motivation to bridge this gap between co-designing and building together in this thesis.

The Case of Awelo School

Figure 30 Case of Awelo

Context of the School



Map of Awelo Primary School
When was it built?

- around 1986
- 2013/14
- 2016-18
- 2020/21
- 2024
- self built structures

Figure 31 Awelo Map

Awelo School is a public educational institution located in Awelo, a district of Siaya, Kenya. The school was established in 1986 and is a public mixed school. There are currently 1.650 learners enrolled in the school. The motto of the school is “Better your Best”. The motto was chosen by the teachers and headmaster. And they chose it to encourage the learners to always do their best and push themselves to become better every day (Wanga, walk-and-talk interview, 2025, Appendix E). The mission of the school is to mold an all-round learner who can benefit the society with the vision to produce learners who are morally upright and enlightened.

The school is funded by the Ministry of Education FPE (Free Primary Education), the CDF (Constituency Development Fund), and the county government of Siaya in terms of infrastructure. The school consists of 30 classrooms with a ratio of 70 learners per classroom with an average size between 20m² and 40m². The newest classrooms that were built in 2024 were adjusted to the 70 learners per classroom and are about 80m² big. The school site spans over 4.2 hectares of land. The language spoken by the learners is Dholuo, but on school grounds, the languages used are English and Kiswahili, as the curriculum is determined by the school‘s curriculum.

The majority of the learners come from low-income backgrounds, with over 60% consisting of single mothers. Most learners live in informal areas of Mahinga, Ombwede, and Aringo Estate. Their parents are subsistence farmers, and others work in restaurants and hotels. 90% of the learners are Luo, an indigenous group native to the region around Lake Victoria, primarily in western Kenya, and almost all the learners are Christians.

The school has two water tanks with a capacity of 10.000 litres each. The school tank and taps receive water from a pumped borehole. Apart from that, the school is also connected to Siaya Bondo Water and Sanitation Company Ltd. (SIBO), which supplies piped water to the school. The school uses 1.000 litres of water daily, mostly used by learners for drinking and cleaning classrooms and offices. However, sometimes the school faces a shortage of water, especially in the dry season from December to March and from June to September (Field Notes, School Information, 2024, Appendix C).

The nine school buildings the school consists of were built at different times. The oldest buildings were constructed by parents and teachers around 1986, during a period when the national government encouraged communities to build schools due to insufficient government resources (Mackatiani et al., 2016). These buildings are quite dark and have no glass in their windows. They also have small classrooms in comparison to later-built parts of the school funded by the CDF between 2013 and 2024.

The next generation of buildings was mostly funded by the CDF and are all more or less constructed in the same way. The classrooms are arranged in linear blocks, with shared open corridors. The materials used are cement blocks and fired bricks for the walls, concrete for the floor, corrugated metal sheets and a wood structure underneath for the roof, and steel-framed doors and windows.

The newest two buildings serve as classrooms for 9th graders, who joined the junior secondary section of the school system with the implementation of the new CBC in 2024. Both buildings are funded by the Ministry of Education. Besides the adjustment of their size, they are built slightly differently than the older classrooms funded by the CDF.

The windows are placed higher so the learners won‘t smash them as easily anymore, the concrete foundation has an attached ramp to it to make it wheelchair accessible, and the entrances are slightly recessed to make them less obvious and more protected against break-ins. All these buildings mirror the cost-driven and standardized approaches introduced by British colonial rule, which prioritized functionality and efficiency over climate adaptation and cultural relevance. The CDF follows the same cost-driven logic with a lack of innovation in layout and material and no communal spaces.

The outdoor space is in some parts left undeveloped, often just bare earth, vulnerable to dust and erosion; in other parts, trees and grass have been planted to prevent the dust. There is a sports field with some grass, two football goals, and poles to span a net for netball and volleyball. In front of the pre-primary classes, there is a structure that once held swings. In the break times the compound is mainly used at the sports field area or in the shade of the tree, where the learners sit on the ground or the roots of the trees, exposing their clothes to the dust and mud depending on the season. Teachers take out chairs and find a cooling breeze under the trees as well while watching over the learners (Field Notes, School Information, 2024, Appendix C).

Siteplan

8th grade in the front building, 1st, 2nd grade and the workshop room for this thesis in the back

The new 9th grade buildings

7th grade to the right, 8th grade in the middle and 9th grade to the left

Wesley: “Our classrooms to the left, the kitchen and canteen to the right and PP1, PP2 and Babyclass in the middle”

Wesley: “Our football field where we like to play”

Figure 32-44 Siteplan

Main entrance to the school with connection to the teachers room and headmasters office

Agriculture feels with dried out plants

Wesley: “Our gate to keep out people who don‘t belong”

Path between 3rd, 4th and 5th grade buildings

Wesley: “Our girl latrines that smell soooo bad!”

“The Assembly where we meet for morning prayers and instructions.“

Edge where classrooms of grade 5 and 6 are meeting.

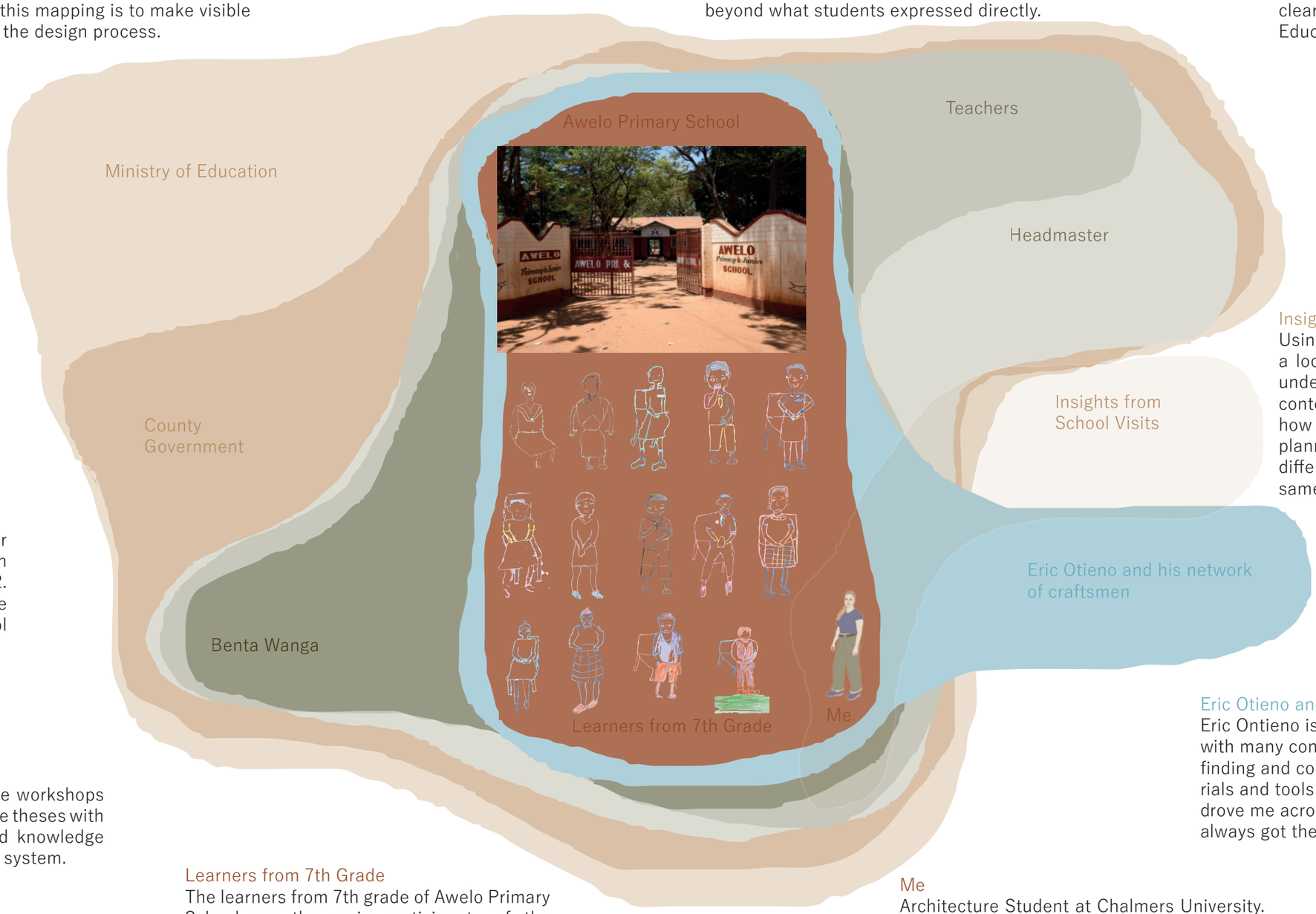
Stakeholder Analysis

In this stakeholder analysis, actors can be differentiated into participants, stakeholders, and institutions. Participants are those directly involved in the workshops, such as the 7th grade learners and me. Stakeholders are actors who influenced or supported the project more broadly. And Institutions refer to organizations with decision-making power or administrative responsibilities. The purpose of this mapping is to make visible how the different actors shaped the design process.

Awelo Primary School
The site gives the opportunity to work with and explore, being the center of this thesis. Providing challenges and opportunities for this work.

Teachers
The teachers were around at the school compound while the workshops were conducted, giving opportunities to have conversations and hear and learn about their personal experiences and concerns regarding the school. Their perspectives helped ground the work in existing practices and highlighted needs beyond what students expressed directly.

Headmaster
The Head of Awelo Primary School participated in the first meeting, where an introduction took place. A warm welcome was extended and the ethical clearance from the Ministry of Education was approved.



Ministry of Education
Is in charge of all the bigger building decisions that concern the Primary and the junior secondary part of the school, including grade 1-6 and 7-9.
To be able to work with the students from Awelo they also needed to provide an ethical clearance approving that workshops with students will be conducted.

Insights from School Visits
Using the possibility to have a look at other schools helped understanding the general context and understanding how schools are designed and planned. It also showed how different schools deal with the same obstacles.

County Government
Is in charge of all the bigger building decisions that concern the Early Years Education 1-2. Nevertheless they provide funding for some primary school projects.

Eric Otieno and his network of craftsmen
Eric Ontieno is a friend and a person with many connections. He assisted in finding and collecting the many materials and tools needed for this thesis. He drove me across Siaya, making sure I always got there in time.

Benta Wanga
she is the contact person for the workshops with the children and supports the theses with her background information and knowledge about the school and the school system.

Learners from 7th Grade
The learners from 7th grade of Awelo Primary School are the main participants of the thesis. They have been part of two 1 hour long workshops every week. The age range of the students is between 12 and 15.
Through child participatory design this thesis includes the insides, ideas and thoughts of the students.

Me
Architecture Student at Chalmers University. As both a facilitator and observer, participatory design workshops with 7th-grade learners at Awelo Primary School have been led . The role involved analyzing student input, developing prototypes based on participatory insights, and exploring sustainable, low-cost design solutions for improving school environments.

Figure 45-60 Stakeholder

Figure 61 Hands-On

Workshops at Awelo

How, Where, With Whom

Length and time

All workshops were carried out between 15:20 and 16:20, during a time when the learners usually have game time. After that, the learners have free lessons that they can use to read or revise their work, so sometimes they decide to stay longer with me to continue our work or help me clean up. That was possible thanks to the teachers who let them decide what they preferred to do. The workshops were carried out twice a week during school hours while 1.650 learners were on the school compound.

Location

All workshops were held at Awelo School. To be able to conduct the workshops and also store some materials, the school gave me the only classroom that isn‘t used by any class at the moment. This classroom was part of a building that was initially built by parents when the school was founded in 1986. When we needed more space or the outside to work with, we used the space in front of the room.

Participants

The 15 7th grade learners that I‘ve worked with are between 12 and 16 years old. 5 of them are boys and 10 are girls.

Facilitation

Each workshop was planned and executed by me. When conducting the workshops, I worked with the learners alone in the room. In case of emergencies or occurring problems, I could have reached out to the closest teachers around or called for Benta, my main contact at the school.

How: 1h from 15:20-16:20 twice a week

Where: At Awelo Primary School in an empty classroom

With Whom: Learners from Awelo and I

Grade: 7
Age: 12-16
Number: 15
Boys: 5
Girls: 10

Figure 62-65 Workshops

Legend:

1,2,3 Grades of the classrooms

Our Workshop Room

Teachers Rooms

Kitchen and Storage Rooms

Latrines

Workshop 1: Getting to Know Each Other & Imagining the Perfect School

Phase 1: Exploration

Purpose: The purpose of this workshop was to get to know each other better as well as to find out how the learners perceive their school and what they think is missing.

Methods: In this workshop, drawing was used as a method to receive a free expression from the learners. Dreaming through Drawing (Architecture Sans Frontières UK, 2014-b) was chosen not only as a creative tool, but also as a way to support non-verbal expression and shared meaning-making in a context where verbal participation can be limited (Tangen, 2008; Duramy & Gal, 2020).

Materials: Paper, color pencils, masking tape and marker

Preparation: As a first step, I planned a big introduction round, followed by a really fun drawing exercise, ending with a drawing task. The task focuses on 3 different questions that the learners were supposed to answer by discussing them and putting them down in the form of drawings and bullet points, focusing on the classroom, the outdoor compound, and dust. These questions were based not only on the outcomes from my previous visit to Awelo with the Reality Studio in 2024 and my initial site impressions but also on the wider context of the thesis. The current school space reflects architecture based on colonial-era design, including their layouts and materials that are often misaligned with the local climate and spatial needs. This workshop therefore aimed to create an open space for learners to share their thoughts and ideas of their school environment and to identify what they think is missing.

Conducting the Workshop

In the introduction round, I asked the learners to tell me their names, what languages they speak, and how long it takes them to get to school in the morning. After each learner finished, they wrote down their name on a tape and gave themselves name tags.

In the second part, I made room for everyone to get used to drawing and let them draw each other's faces and let them swap to the next person every 30 seconds, which made the drawing fun and playful. The reason for this is for me to have a fun group picture of all the learners without showing their faces, protecting their privacy.

In the last part of the workshop, I divided the learners into three groups. I divided them by counting to three because I wanted them to mix and get to know each other better because they are from different streams of

Date: 13th of February

of grade 7. Each group got a big paper with a question on it and colored pencils. Then they were allowed to discuss the question in their preferred language and start drawing answers to the questions.
The questions where:

What would the perfect space to learn look like?

What does the perfect outdoor space look like?

What solutions against dust do you know? What of these ideas could be solved by an architect or craftsman?

Have a small discussion about it. Think about what things you have seen in other schools or buildings and parks in your neighborhood. What do you like about them? What materials are they made of?

Output and Results

From the first step of the workshop, I discovered that the learners speak three languages: English, Swahili, and Luo, their mother tongue. Most of them walk to school and have an average way of 10-15 min. Two of them had to walk for over one hour.

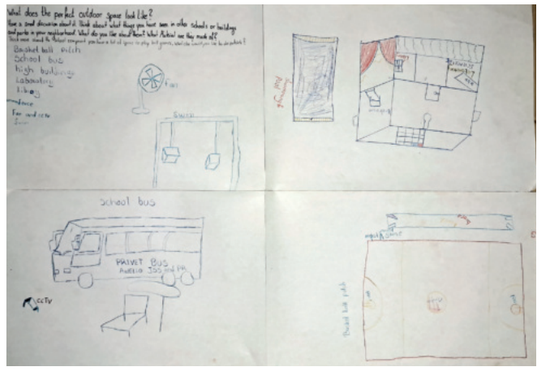
From the second step, I learned that giving them a little bit of time pressure makes them draw more freely and with less fear.

And in the last step, I let each group explain to me what they did and why.

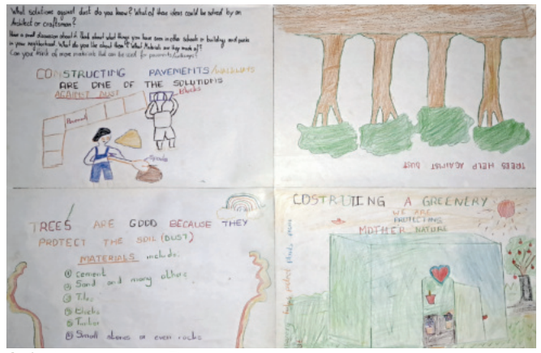
Figure 66-69 Workshop 1

These were their responses:

Space to Learn
„We want a big garden with trees and swings, and a strong fence to keep us safe. Inside the house, it should be quiet and clean so we can learn better. There should be enough water for everyone, maybe a water tank connected to the house. And outside, there should be a pool to cool off, space to grow food, and even an apple tree where we can pick fruit whenever we want. We also want swings to play during break time.“



Outdoor Space
„We thought about more than just the outside. We want fans in the classrooms, a library, a science lab, and a bedroom where we can rest during break time. Outside, we'd love to have a school bus that picks us up in the morning, a swimming pool, security cameras, swings, and a basketball field with benches where people can watch the games and chairs where we can just sit and chill.“



Solutions against Dust
„We can plant trees to stop the dust, and we even drew a greenhouse to protect the small plants until they are strong enough. We also thought about building paths using cement, sand, tiles, blocks, timber, small stones, and even big rocks, anything that could help keep the dust down.“

Analysis

+ Agriculture is done on the school compound and is also part of the curriculum, but during the dry season there is nothing really growing. Maybe a greenhouse could help.

+ The school does not have any swings, but there is an old structure that is stable enough to still carry swings. (the old ones got stolen.)

+ Benches and spaces to sit outside during breaks or to watch ball games at the sports field do not exist in the school. In the afternoon, tables and chairs are carried outside, and lessons are held outside.

+ There is an opportunity here to work with some sort of outdoor sitting area with one problem: things that are not anchored in the ground get stolen.

+ A greenhouse that protects the plants from drying out. could be something to focus on.

+ Materials like sand, timber, and small rocks for pavements are good alternative ideas for pavements, leaving the ground unsealed while still protecting it from the dust.

- It will not be possible to build a strong and big fence around the whole school compound because it is several kilometers long, and to make it strong, it requires expensive materials.

- Water tanks. There are two big water tanks on the compound that get filled with the water from the Awelo district. (Now is one of the driest seasons and there is still water available.)

- A swimming pool is not sustainable in a school where water is already short.

- Planting trees. The school is planting new trees in every break period the school has. So that topic is covered.

The ideas are sorted by plus and minus, considering the durability for me and the children without a lot of external help, as well as the thought of whether an idea is related to architecture.

Takeaways

Even though the questions were designed more openly, the learners connected them to the school after all, so the outcome was not as free and creative as hoped for. Nevertheless, it gave a good understanding of how the learners perceive their school and what they think is missing. In the matter of the exploration phase, a lot of input was received.

Workshop 2: Designing Places to Sit Together

Phase 2: Co- Designing

Date: 18th of February

Purpose: The purpose of this workshop was to explore how learners imagine outdoor seating spaces when given the freedom to design based on their own needs, habits, and preferences.
The aim was to gather creative input for future prototyping while allowing learners to express their vision in a playful and collaborative way.

Methods: In this workshop, dreaming through modeling was used as a method to achieve a free design of the learners. Dreaming Through Modeling (Architecture Sans Frontières UK, 2014-b) supports child-led design by making spatial ideas visible through hands-on creation, allowing students to express themselves without needing advanced drawing or verbal skills (Tangen, 2008; Duramy & Gal, 2020).

Materials: Self drying clay, paper, scissors, pencils, materials from the school ground, masking tape and markers

Preparation: Building on the insights I gathered in Workshop 1, the second workshop shifted from exploring and expressing needs through drawing and discussion to visualizing and shaping their ideal outdoor seating areas by using natural and found materials. I prepared the session with a focus on encouraging creative freedom while grounding the activity in the context of their school environment.

Conducting the Workshop

In the beginning of the workshop, everyone made themselves a name tag with the tape and marker. I divided the learners into the same three groups as in Workshop 1. Then I explained to them what models are and that materials are needed to be able to build them. I asked them to go outside and collect materials like sticks, leaves, flowers, stones, and anything else they could find and think could fit.
While the learners searched for materials, I set up the places with paper, scissors, and clay as an addition to what the learners may find outside.

After the learners sat down with their materials, I explained the task of building an outdoor sitting area for the school to them. To spark their creativity, I showed them examples of a lot of different sitting spaces, but they were asked to also come up with their own ideas. At the end of the workshop, I asked each group to briefly explain to me what they did and why.

Output and Results

„We made a sitting place with a big table in the middle where we can study or hang out. Around it are walls to protect us, and we added a box where we can keep our things. We also put some plants around to make it nice and green.“

„Our group made a sitting area with a big table and another one next to it for studying. We added walls to make it feel safe, and we put plants into the walls so the space feels more protected and calm.“

„We built a comfy sitting spot with a food basket in the middle, it has chocolate and fruits like bananas. We made walls that go around the trees, so the trees are part of the space and give us shade.“

The first group of learners created a sitting group with a big table in the middle that can be used for studying and hanging out; it has protective walls and a box for storage. Some greenery is surrounding it.

The second group created a sitting area around a table and a table next to it for studying, as well as some protected walls that have integrated greenery, giving even more protection to the site.

The third group of learners built a comfortable sitting group, with a food basket filled with chocolate and some fruits, including bananas, in the middle and some protective walls that go around some trees, including them in the site.

Analysis

+ The learners showed that for them, sitting together means sitting in a circle facing each other, having a social gathering.

+ The learners really like to have plants around, probably because they bind the dust, and where there are plants, there is no dust.

+ Some of the learners really got creative on how to combine sticks or old bottle lids with the clay to build a more stable structure.

- All the groups got inspired by each other and did really similar designs.

The bullet points are sorted by plus and minus considering the durability for me and the children without a lot of external help as well as the thought if an idea is related to architecture.

Takeaways

This workshop showed that the learners prefer circular seating arrangements rather than sitting in rows as they do during class. A space that supports both social interaction and studying.
The output of this workshop formed the foundation for the upcoming prototyping phase, where the aim was to develop seating solutions responding to the learners‘ expressed needs and creative ideas.

Figure 70-76 Workshop 2

Workshop 3: Prototyping with Pathway Materials in Dust

Phase 3: Prototyping, Material Testing

Date: 20th of February

Purpose: This workshop focused on the theme of dust and what kinds of materials I could test with the learners that might prevent it in a cost-friendly and sustainable way. The purpose was to try out different kinds of materials on the ground to see if they could be used as pathways or general ground cover solutions against dust and mud. I chose this focus early on because the rainy season begins in March, when the problem shifts from dust to mud.

Methods: In this workshop, prototyping in the form of material testing was used as a method to explore together with the learners the potential of low-cost and freely available materials as solutions for dusty ground surfaces. Prototyping here is understood as a participatory method that supports hands-on exploration and lets children evaluate materials through direct experience, aligning with the thesis's emphasis on situated, child-led design (Budde et al., 1992; Kirjavainen et al., 2005).

Material: Wood waste, sugarcane fibres, Sand, 3 wooden frames, masking tape and marker

Prepartation: The third workshop required careful planning and early preparation, as it involved gathering ground materials. The choice to prototype dust-reducing solutions emerged directly from the students' earlier drawings and discussions in Workshop 1, where dust was highlighted as a major problem and materials like sand and timber were suggested. In response, I sourced low-cost and locally available alternatives, including sand, wood waste, and sugarcane waste, all selected based on availability and affordability.

Conducting the workshop

Three frames were premade out of wood. Wood waste from a workshop, sand from a hardware store, and sugarcane waste from a waste site next to the road were collected and all brought to school.

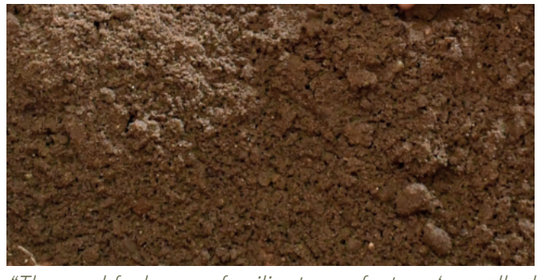
Wood waste was an idea that came up from the ideas of the learners about using timber as a pathway. But since timber is an expensive material used for entire pathways, I chose the free alternative: shredded waste pieces that can be collected from wood workshops. It works similarly to mulch and helps protect the biosystem underneath by storing water.

Sugarcane waste has similar characteristics and is also always available. I chose it based on both informal research and the fact that these waste sites are common around town.

Finally, I chose sand, as it was one of the materials the learners came up with by themselves. I chose it because it prevents soil compaction and allows water to flow through. The only downside was that it had to be bought.

"The sugar cane feels like we are walking on clouds, but the wind keeps on blowing it away. I love that we found some sugarcane pieces in there that we could eat."

"The wood waste feels nice and soft under our feet, but strong winds might take it away."



"The sand feels more familiar to our feet; we've walked on it before, but it is so heavy to lift up the sack of sand."

In the beginning of the workshop, everyone made themselves a name tag with the tape and marker. Then I explained to the learners what a prototype is and what the idea behind it was. It was also clarified that the chosen materials emerged from the outcome of the first workshop, where the group that drew dust solutions brought up sand and wood.
In a shady but dusty place outside, we put the frames on the ground, and then one by one they were filled with each of the materials. After that I asked the learners to walk over each material and try out how they feel under their feet.

Output and Results

The sugarcane fibers felt the nicest in the learner's opinion, but it also raised concerns about the wind blowing it away because of its lightness. The sugarcane fibers were easy to work with. They were light, easy to carry, and easy to place in the frame. But they also felt really unfamiliar as a building material to the learners.
The wood waste was something new for the learners but also something that they agreed on being a good alternative to sand or other known materials. It was easy to work with because it is light enough to carry and spread into the frame.
The sand got the best feedback but also the most complaints of being heavy and hard to work with. It took the longest to fill the frame with sand.

Analysis

\+ All of the materials felt really nice under the feet to walk on.

\+ Sand was heavy enough and resistant to the wind.

+/- The wood waste got taken up by the wind a little bit but it also stuck to the frame quite well. When being made wet once it can store the water and is also more likely to stick to the ground keeping a good biosystem underneath.

\- Sugar cane waste is really light and got blown around everywhere and did not stick to the frame.

The bullet points are sorted by plus and minus considering the durability for me and the children without a lot of external help as well as the thought if an idea is related to architecture.

Takeaways

All the materials were easy to work with for the learners. The learners really liked how it felt to walk on the sugarcane; one of them said it was like "walking on clouds." But they all agreed that this material is not the best to work with since the wind can take it away really easily.
They liked and understood the idea of using the wood and also how it felt under their feet, but overall they preferred the sand. They felt comfortable with it because they had seen and walked on it before.

Figure 77-84 Workshop 3

Workshop 4: Creating Play Elements from Old Car Tires

Phase 4: Prototyping, Co- Building

Purpose: The purpose of the workshop was to try out what things the learners can build. To try out what is possible to conduct with the learners and where help of craftsmen might be needed.

Methods: In this workshop, prototyping in the form of co-building was used as a method. Allowing students to construct items for their school enhances their sense of pride. Prototyping was used not just as a method of making, but as a way for learners to transform their ideas into reality, share responsibility, and gain a sense of ownership in shaping their school environment (Duramy & Gal, 2020; Kirjavainen et al., 2005).

Materials: Car tires, pre-cut wood panels, rope, wood saw, screws, screwdriver, electric drill, drill needles, lighter, brushes, purple and blue paint, masking tape and marker

Preparation: The materials for this workshop were chosen by me. My visit to other schools made me aware of the possibility of termites on the school grounds. Termites eat wood, and that‘s why I decided to mostly work with car tires for this workshop, just to be safe. Later I learned that Awelo thankfully doesn‘t have a termite problem. To prepare, I collected 6 car tires were collected; additionally, some rope, screws, carabiners, wood, and paint were bought. For tools, a saw, cutter knives, scissors, brushes, and a lighter were bought, and an electric drill was lent by a wood workshop close to the school.

Conducting the workshop

In the beginning of the workshop, everyone made themselves a name tag with the tape and marker. Then I explained to the learners that the task was to build three different things in three different groups. One group was supposed to build a swing, a result from the first workshop where they expressed that this is something missing at the school. The second one should build a seesaw in addition to the missing play facilities on the school compound, as they expressed in conversations. And the last one should build a seat as a first tryout, finding solutions for sitting spaces on the school compound, as they also asked for in the first workshop.

On the 4th, the workshop consisted of first cleaning the old car tires. After that, the learners were allowed to choose their group and topic, which happened naturally and independently, without any adult intervention, showing that the learners were already confident in taking initiative and taking responsibility

Date: 4th-21st of March

Different solutions on how things could be built were shown to the learners while giving them paper and pencils at the same time to give them the opportunity to make their own solution. After they decided, I gave them safety instructions on how to work with the tools, and I made clear that these tools are no toys.
So they started building. After only 5 minutes it became clear that it was not possible to cut the tires with a simple saw. So the learners continued with other parts. When the workshop was over, I took the car tires to a welder to cut them.

Figure 85-92 Workshop 4

Output and Results

The seat that turned into a trampolin

The finished swing and the children having

The seesaw and the girls playing with it

Everything in action

On the 6th, the workshop continued. All the groups worked hard on their tasks, and the swing group successfully completed their first swing. We continued working on all things until they were done on the 13th of March.
From then on until the 21st of March, we painted all the things we built in the most common favorite colors of the learners, purple and blue.

Analysis

\+ The learners really enjoyed building with the car tires.

\+ Building with car tires is quite easy to learn and can be done with a limited variety of tools.

\+ When the learners fully understood that this was something the school was truly allowed to keep, they were visibly happy and proud. One of the girls asked aloud if the swing was actually for them and their school. A moment that revealed both excitement and uncertainty. I clarified that we were building this for Awelo, based on their own ideas and wishes. This small exchange seemed to shift the atmosphere in the group, strengthening their sense of ownership and connection to what we were creating.

\+ The learners started helping each other out, sharing the tools and exchanging tips and tricks. It was really nice to see that they learned from each other.

\- The limited tools make the process go slow.

\- Building takes more time than expected.

\- If tires need to be cut, it needs to be done by a machine and a craftsman.

The bullet points are sorted by plus and minus, considering the durability for me and the children without a lot of external help, as well as the thought of whether an idea is related to architecture.

Takeaways

Building things with the learners is a great way of showing and engaging them in what they can actually do themselves to improve the school environment.

Things take quite long to finish, so it could be helpful to do parts with the learners so they see and understand but also get help from local craftsmen to get more things done in a faster time to be able to build something bigger.

Voluntary Homework: Storytelling

Phase 1: Exploration

Purpose

The aim of the voluntary homework was to gain insight into the everyday school experiences of the learners. The initial thought was to spend one day with the learners to experience it myself, but after spending some time on the school compound, I realized that I would become the center of attention, interrupting their lessons. As a white foreigner, often referred to as mzungu, my presence attracted curiosity and excitement, making it difficult to observe daily school life without influencing it.

Methods

In this voluntary homework, directed storytelling in the form of asking questions was used as a method to gain insights into the learners‘ daily lives at school.
Grounded in the Directed Storytelling method (Martin & Hanington, 2012), this approach provided a reflective and participant-led way for learners to share daily experiences, aligning with the thesis's emphasis on situated, child-led knowledge.

Preparation

For the voluntary homework, I prepared a paper with written questions for each of the learners.
The paper had the following tasks:

Choose your favorite school day. Write down the story of that day.

When do you wake up? When do you get to school?

What lessons/classes do you have? What do you do during break time?

Where do you eat lunch? What do you do after lunch?

You can write the story in English or Kiswahili, as you prefer.

Name: Age: Favorite color:

Date: 13th of March

The voluntary homework was explained to the learners at the end of workshop 4. I made it clear that this was voluntary for those who wanted to do it and help my thesis with that. It was handed out to all the learners who wanted to write it, which, to my surprise, was all of them. Each learner was allowed to choose their favorite colored pencils and borrow them for the homework. I told them that they could write the story in their preferred language and that there is no need to write it in English because I have friends who can translate it with me. I also told them that they can take their time and bring it back once they are done with it next week.

Output and Results

On Tuesday the 17th, I received all the written stories from the learners, written in English so it‘s easier for me to understand, they said. All borrowed pencils were returned and put back into their boxes.

Most of the stories were at least one page long and filled with many details of their favorite day. While reading through them, it became evident which of the learners were friends since they seemed to enjoy the same days. My overall impression was that the students liked Tuesdays and Fridays (which sometimes is sports day) the most, which shows that they like drama, debating, games, and raising the flag in the assembly, and on sports days they meet friends from other schools at the sports field on Fridays. (If there is deeper interest in reading the learners‘ stories, they can be found in Appendix D)

The reason that I asked for their favorite colors was that I wanted to know what colors would make them happy to paint the Play Elements from workshop 4 in. So while reading through their stories, I wrote down the colors they named and evaluated them in the end, leading to blue and purple.

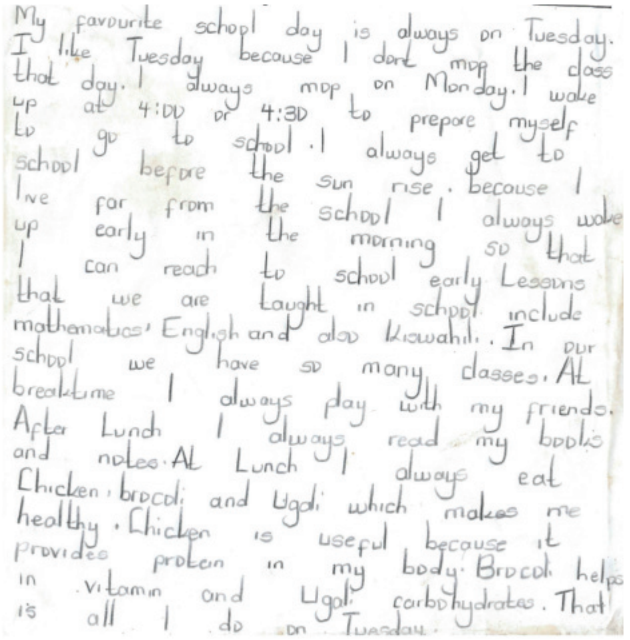
Work Emerging from the Findings and Stories

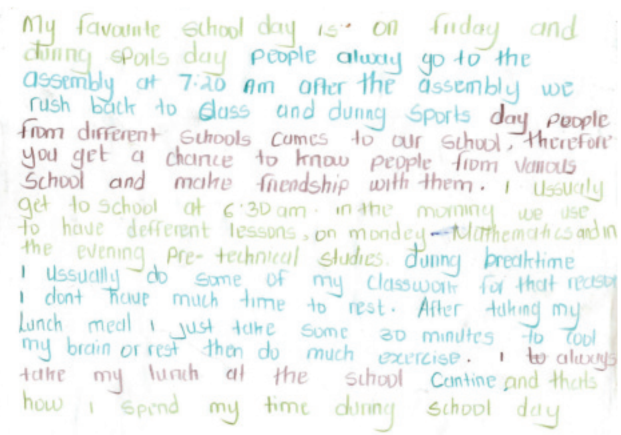
I read all of the stories and wrote down the parts that I found the most interesting and important of each story. Then I also reflected on things I have heard and seen at the school and wrote them down as well.

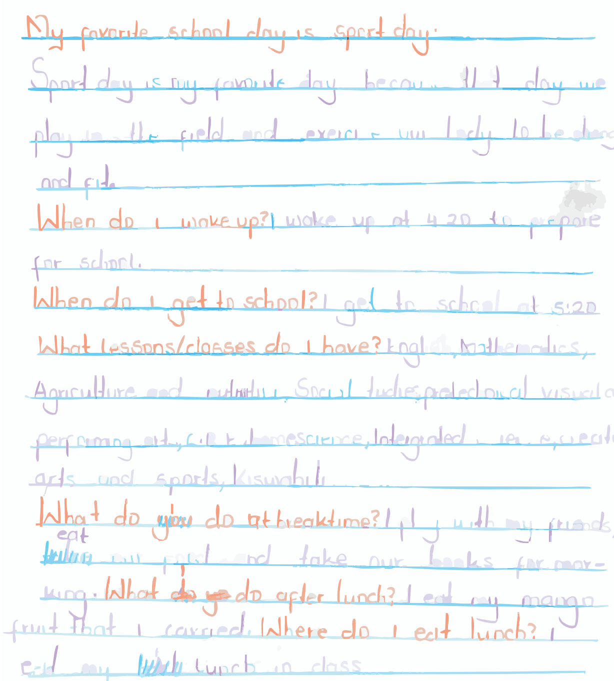
From all this information, the character Wesley was developed, whose story you read at the beginning of the thesis.

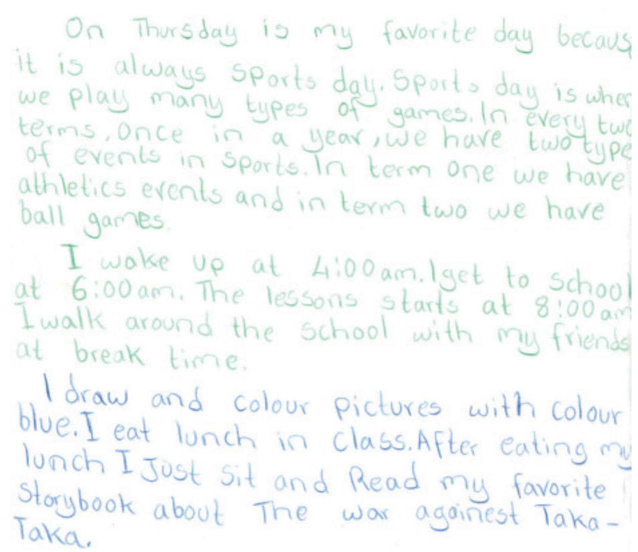
Takeaways

One noticeable takeaway from this voluntary homework was the learners‘ high level of discipline, responsibility, and engagement. They worked on the task with persistence and care, submitting their stories with thoughtful details. This reflects on their commitment and pride in their participation as well as a school culture where learners show respect towards their teachers and tasks given to them.


My favourite school day is always on Tuesday. I like Tuesday because I dont mop the class that day. I always mop on Monday. I wake up at 4:00 or 4:30 to prepare myself to go to school. I always get to school before the sun rise. because I live far from the school I always wake up early in the morning so that I can reach to school early Lessons that we are taught in school include mathematics, English and also Kiswahili. In our school we have so many classes. At breaktime I always play with my friends. After Lunch I always read my books and notes. At Lunch I always eat Chicken, brocoli and Ugali which makes me healthy. Chicken is useful because it provides protein in my body. Brocoli helps in vitamin and Ugali carbohydrates. That is all I do on Tuesday.


My favourite school day is on friday and during sports day people alway go to the assembly at 7:20 Am after the assembly we rush back to class and during Sports day people from different schools comes to our school, therefore you get a chance to know people from various school and make friendship with them. I ussualy get to school at 6:30 am. in the morning we use to have defferent lessons, on mondey Mathematics and in the evening Pre-technical studies. during breaktime I ussually do some of my classwork for that reason I dont have much time to rest. After taking my lunch meal I just take some 30 minutes to cool my brain or rest then do much exercise. I to always take my lunch at the school Cantine and thats how I spend my time during school day


My favorite school day is sport day.
Sport day is my favorite day [illegible] that day we play in the field and exercise [illegible] to be strong and fit.
When do I woke up? I woke up at 4:20 to prepare for school.
When do I get to school? I get to school at 5:20
What lessons/classes do I have? English, Mathematics, Agriculture and [illegible], Social studies, pretechnical, visual arts, performing arts, CRE, homescience, Integrated [illegible] arts and sports, Kiswahili
What do you do at breaktime? I play with my friends, eat our food and take our books for marking. What do you do after lunch? I eat my mango fruit that I carried. Where do I eat lunch? I eat my lunch in class


On Thursday is my favorite day because it is always Sports day. Sports day is when we play many types of games. In every two terms, Once in a year, we have two type of events in Sports. In term one we have athletics events and in term two we have ball games.
I wake up at 4:00 am. I get to school at 6:00 am. The lessons starts at 8:00 am I walk around the school with my friends at break time.
I draw and colour pictures with colour blue. I eat lunch in Class. After eating my lunch I Just Sit and Read my favorite Storybook about The war againest Taka-Taka.

Workshop 5: Prototyping with Pathway Materials in Mud

Phase 3: Prototyping, Material Testing

Date: 21st of March

Purpose: This workshop focused on the theme of mud and what kinds of materials can prevent it while being cost-friendly and sustainable. The purpose was to try out the same kind of materials used in workshop 3 to see if they could be used as pathways or general ground cover solutions against mud. The focus was chosen again now, after the rainy season had started, to see how the materials behave in mud in comparison to dust.

Methods: In this workshop, prototyping in the form of material testing was used as a method to explore together with the learners the potential of low-cost and freely available materials as solutions for muddy ground surfaces. Prototyping here is understood as a participatory method that supports hands-on exploration and lets children evaluate materials through direct experience, aligning with the thesis's emphasis on situated, child-led design (Budde et al., 1992; Kirjavainen et al., 2005).

Material: Wood waste, sand, 3 wooden frames, masking tape and marker

Prepartation: This workshop required some more research from my site on how grounds with wood waste would be installed if used for playgrounds. It requires a thin 5 cm layer of sand topped up with about 30 cm of wood waste. The sand acts as a drainage layer before the wood waste is added for dust and mud control as well as shock absorption.
So I decided to exclude the sugarcane fibers in this round, and instead we tested sand and wood and a combination of both in the frames.

Conducting the workshop

Three frames, the wood waste, and the sand from workshop 3 were reused to test the material on the mud.

In the beginning of the workshop, everyone made themselves a name tag with the tape and marker. Then in a shady but muddy place outside, the frames were put on the ground and then one by one were filled with sand, wood waste, and the combination of both, while I made sure that the sand layer was thinner then the wood waste one. After that, I asked the learners to walk over each material and try out how they feel under their feet and also explained that we are going to keep the frames outside to test how the material will behave with the mud over time. The learners warned me that the material will probably be played with and destroyed or stolen.

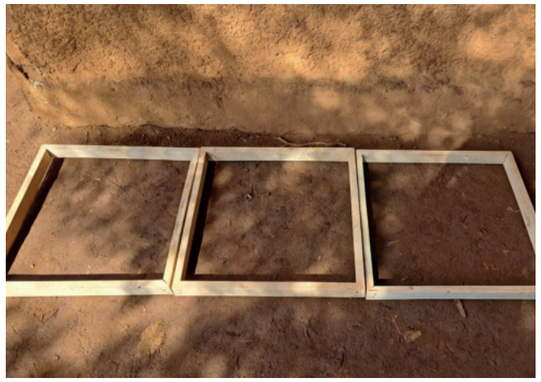


Figure 93-100 Workshop 5

Sand:

Wood waste:

Combining Sand and Wood:

What I came back to after a few days:

Output and Results

The learners felt the same way about the materials as they did before and were curious about the combination of sand and wood waste, listening carefully to my explanation of why different layers have many benefits, like the sand base drains water and creates stability, and the wood waste layer stores moisture and is bouncy, so it doesn't hurt if you fall. One result was that the learners learned a lot about materials.
I learned that the Learners were right about the destruction of our prototypes. Two days after the workshop, the other learners had played and destroyed the frames, and one of the teachers told me she cleaned up the mess and that she was sorry that this happened. So there was no possibility for a long time testing.

Analysis

+ All of the materials really felt nice under the feed to walk on.

+ Sand was heavy enough and resistant to the wind.

+ The combination of sand and wood worked quite well and gave the fluffy feeling from the wood and a stronger foundation from the sand. It felt more natural for the learners to walk on.

+/- The wood waste stuck to the frame quite well. After walking over it several times, you could feel how the wood already started absorbing and storing the water from the mud, keeping a beneficial biosystem underneath.

The bullet points are sorted by plus and minus considering the durability for me and the children without a lot of external help as well as the thought if an idea is related to architecture.

Takeaways

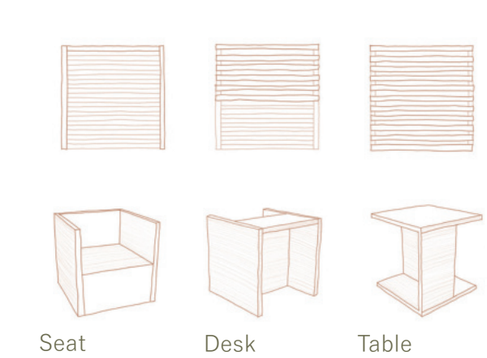
All the materials were easy to work with for the learners. They liked and understood the idea of using the combination of sand and wood and also how it felt under their feet. A long time testing period was not possible in the way I hoped because of the curiosity of all the learners around sadly destroying it. To end this on a positive note, the frames might not have fulfilled its purpose of the testing phase, but it surely gave the learners some great things to play with.

Workshop 6: Building Seating, from Idea to Reality

Phase 4: Prototyping, Co- Building Date: 25th of March - 1st of April

Purpose

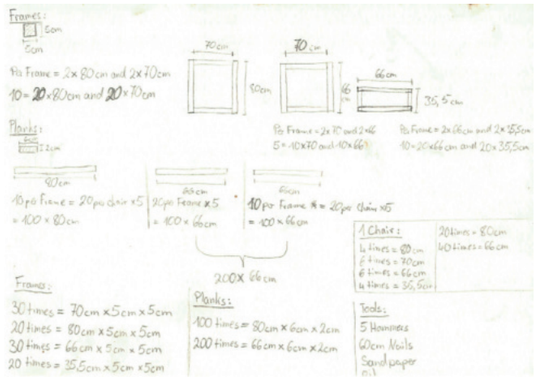
This workshop focused on co-building outdoor seating solutions. The purpose of this workshop was to build outdoor seating elements based on the learners' ideas. By choosing a multifunctional, moveable design, it includes several ideas expressed by the learners, like places to sit together, spaces to study, and seating to watch ball games at the sports field. By involving the students in the physical construction process, the workshop aimed to strengthen their sense of ownership and agency over the school environment while also exploring what can realistically be built on site using local materials, basic tools, and shared effort.



Design Finding

Methods

In this workshop, prototyping in the form of co-building was used as a method to translate students' design ideas into real structures while allowing them to engage hands-on with the construction process and experience the impact of their own contributions. Prototyping aligns with participatory design values that emphasize shared authorship and student agency while also challenging top-down design norms in postcolonial school environments (Duramy & Gal, 2020; Parashar & Schulz, 2021).



Material Calculations

Materials

Wood, sand, nails, hammers, wood saw, brushes, finish oil, masking tape and marker

Preparation

The sixth workshop required some more preparation time. I needed time to get an idea and create a design that meets as many ideas of the learners as possible. I needed to try out the size for it in 1:100 models. From there I needed to calculate the amount and size of the needed wood that I wanted to work with. Tools needed to be bought, and wood needed to be ordered and pre-cut. To make the work for the learners a little bit easier, I pre-built the single frames that were needed to build the multifunctional outdoor piece of furniture.

Wood Supply

Children planking one of the Frames

Getting rid of sharp edges

Slowly getting used to the hammer

Conducting the Workshop

In the beginning of the workshop, everyone made themselves a name tag with the tape and marker. I started the workshop by reminding the learners of our second workshop, in which we modeled outdoor seating solutions. After that I showed them a small model of what I have translated their ideas into.

I asked the learners to divide themselves into 3 groups. One of the groups was allowed to take out the playthings we built in the previous workshop, while the other two groups each got a wooden frame. I explained to them that these frames needed to be planked with boards to get a surface to sit on and write on. After 20 min I let one of the groups swap with the playgroup, and we continued building the furniture. I took the finished parts and started putting them together with the help of some of the learners while others continued planking the frames. After the next 20 min we swap groups again so every group got to play once.

At the end of the first day of this workshop, we finished one and a half pieces of furniture. In the five days of this workshop, the learners finished building 4 multifunctional outdoor seats and treated them with oil, while a craftsman and I finished 4 more on the weekend in between.

Figure 101-106 Workshop 6.1

The result of this workshop was 8 multifunctional outdoor seats for Awelo School. The furniture was based on ideas from Workshop 1 and 2, incorporating multiple uses, such as seating, desks, or tables, offering flexibility depending on how the elements are arranged.

Analysis

+ Learners were actively engaged and proud to see their ideas become reality.

+ The final furniture is flexible, functional, and grounded in student needs and ideas.

+ The group rotation system allowed everyone to participate and play.

+ The activity helped build technical confidence and teamwork.

+ Learners saw how their creative ideas could become real, useful objects.

+ Collaboration with a craftsman enabled finishing pieces that needed additional support.

- Some tasks (e.g., assembling full structures) were too difficult without adult help.

- Time constraints required some parts to be built outside workshop hours.

The bullet points are sorted by plus and minus considering the durability for me and the children without a lot of external help as well as the thought if an idea is related to architecture.

Takeaways

This workshop marked a meaningful step in translating the learners' ideas into built reality. By taking part in the construction process, the students not only saw their designs come to life but also experienced the physical and collaborative effort required to build for their environment. The multifunctional seating elements they helped create reflect their needs and flexibility.


many helping hands


Cleaning before painting


lets give it a protective glaze


Can I use one of the brushes now?!


First finished chair


The boys testing out the new seat


Taking breaks is important too!


Came back to the workshop and the chairs were already in use by learners and teachers.


"That looks almost like what we modeled out of clay"

Figure 107-115 Workshop 6.2

Saying Goodbye: Sharing What We Built

Phase 5: Hugs and Goodbyes

Purpose
The purpose of this final meeting was to share the experience by spending time together using the things we had built together. It was also a moment to reflect on what had been created, not only in terms of physical structures but also through collaboration, trust, and shared joy.

Methods
Even though this was not a formal workshop, it was still shaped by participatory principles. It allowed the learners to interact freely with the finished pieces, exploring their adaptability, and take ownership of their work. It also included celebration and memory-making as important steps in wrapping up a co-created process.

Materials
Polaroid camera and pictures, all the things we built together, juice, cups and cookies

Preparation
For this session, juice and cookies were bought to celebrate and say goodbye. A Polaroid camera was prepared with enough pictures. The outdoor seating pieces were arranged in various ways, and the play elements were taken outside to play.

Conducting the workshop
The students began by helping arrange the multifunctional outdoor furniture in different constellations, forming circular conversation areas, desks, and stands for watching sports games. They played on the swings, seesaw, and trampoline, and in the end we cheered with juice, had cookies, and took the Polaroid pictures. We took 16 group pictures, ensuring that everyone received their own copy.

Date: 2nd of April


Using the seats as homework desk


Using the new seats arranged as a hang-out area


When all learners are playing


Cheers to two months of great building together


Cheering for the football team


One last group picture

Figure 116-121 Saying Goodbye

Output and Results

- 16 polaroid photos.
- First informal use of the play elements and multifunctional furniture in different settings.
- Final conversations, feedback, and heartfelt farewell.

Takeaways
This workshop marked a meaningful step in translating the learners' ideas into built reality. By taking part in the construction process, the students not only saw their designs come to life but also experienced the physical and collaborative effort required to build for their environment. The multifunctional seating elements they helped create reflect their needs for flexibility.

Implementation of Design and Prototyping Guide

Figure 122 Design Proposal - “Reaching hands“

Implementation of the Built

One outcome besides the guide and tool sheet is a series of small-scale spatial interventions developed and built together with the learners of Awelo School. These interventions respond directly to the learner‘s and sites‘ needs, including lack of seating and spaces to play.

The following site plan shows where each element could be placed and used by the learners and teachers.
Additional drawings illustrate the flexibility of the furniture as places to sit, rest, perform, play, and gather. Together, these interventions form a tangible outcome of the participatory process, turning student ideas into real, usable space.

The places that are suggested in the following siteplan were chosen by the insights gained from observation, using the most popular spaces the learners would play, chat, and rest.

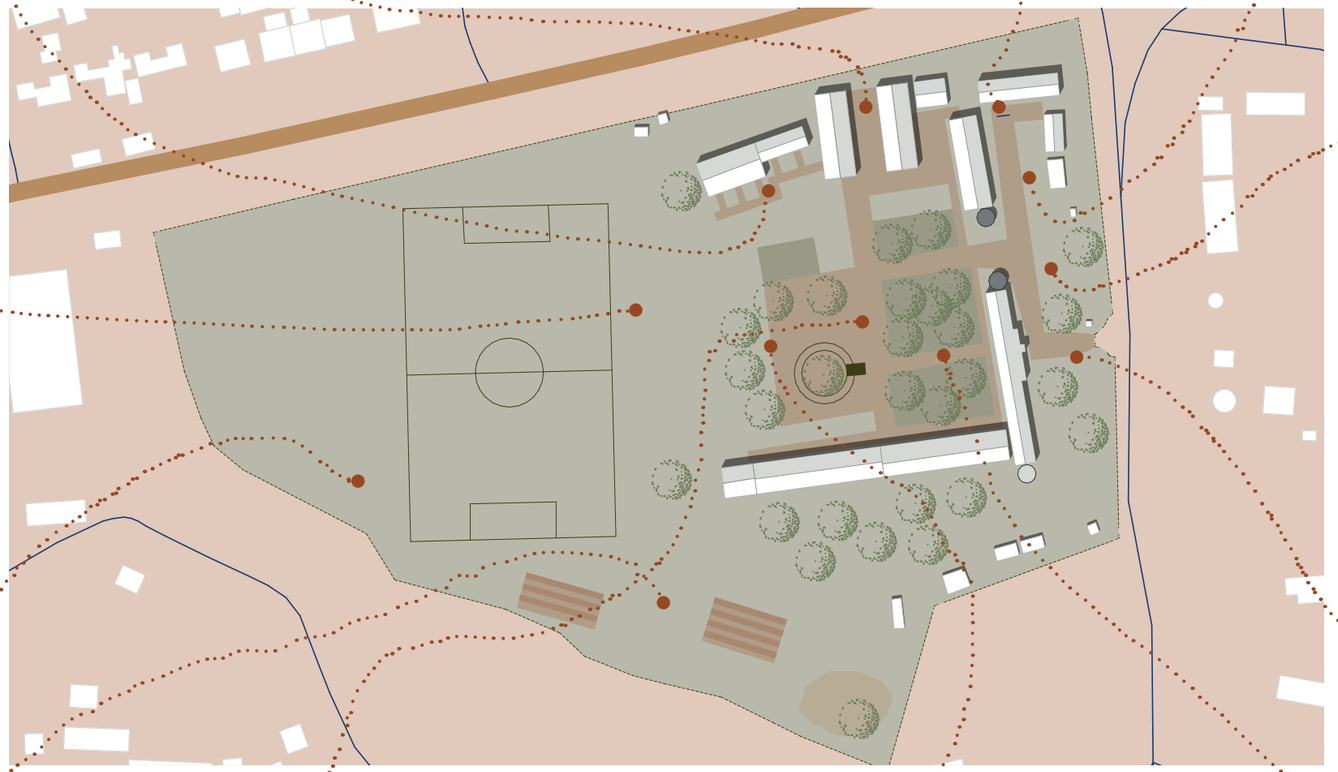
Teachers of Awelo using the furniture to rest in the shades

9th graders lending the seesaws for some fun in their break

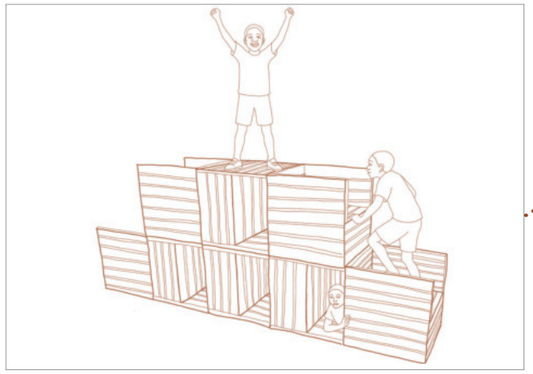
The new swings on the old structure

Enjoying a little jump on the trampoline

Using the furniture as a stand to cheer on the football team



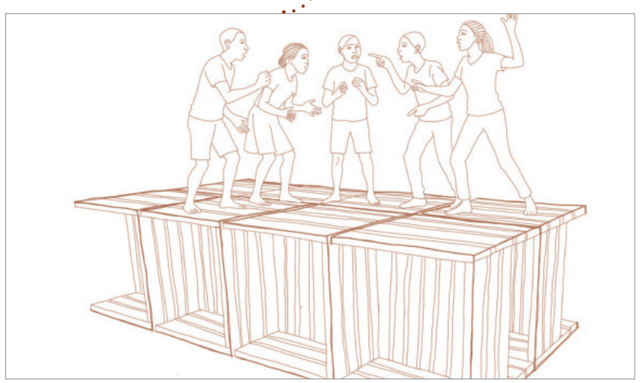
Using the new furniture as a lunch spot



Using the furniture as a modular climbing structure

Using one of the seats to wait for pickup up after school

Resting spot for the agriculture class



The drama class using the tables as a stage

New Lunch spot in the shades of the trees

Study time on the new desks outside

From Workshops to Guide: Why and How This Guide and Tool Sheet Was Developed

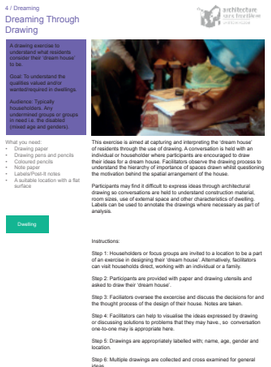
This guide was born out of real challenges and insights from working with children at Awelo Primary School in Siaya, Kenya. It was informed by a series of hands-on workshops in which children co-designed, tested, and built their ideas to improve their outdoor school environment. This guide is a reflection of that process, working with the key takeaway and knowledge gained on site.

One main inspiration for this guide and especially the tool sheet is the toolbox from Architects Without Borders (ASF) that provides facilitators with tool sheets for different workshop strategies, stopping at the co-design phase (Architecture Sans Frontières UK, 2014). These tool sheets helped a lot on-site conducting workshops, but as the work continued and overcame the co-designing phase, guidance was missing. This was the inspiration for the creation of a continuing tool sheet with an extra guide on how to plan, structure, and carry out full-scale prototyping with children in under-resourced school environments. The guide offers orientation and values, while the tool sheet focuses on practical steps, materials, and facilitation during the building process.

Issues like dust, lack of seating, limited play infrastructure, and the difficulty of managing materials and tools in a crowded environment all became design lessons. These lessons and the gap in research material on full-scale modeling in relation to child participation shaped the practical strategies and values embedded in this guide.

This guide is not a fixed set of instructions but a record of what worked, what didn't, and how to navigate similar challenges.

The Inspirational Tool sheet from Architects without Borders



4 / Dreaming

Dreaming Through Drawing

A drawing exercise to understand what residents consider their 'dream house' to be.

Goal: To understand the qualities valued and/or wanted/required in dwellings

Audience: Typically householders. Any undermined groups or groups in need i.e. the disabled (mixed age and genders).

What you need:
- Drawing paper
- Drawing pens and pencils
- Coloured pencils
- Note paper
- Labels/Post-It notes
- A suitable location with a flat surface

Dwelling

This exercise is aimed at capturing and interpreting the 'dream house' of residents through the use of drawing. A conversation is held with an individual or householder where participants are encouraged to draw their ideas for a dream house. Facilitators observe the drawing process to understand the hierarchy of importance of spaces drawn whilst questioning the motivation behind the spatial arrangement of the house.

Participants may find it difficult to express ideas through architectural drawing so conversations are held to understand construction material, access, use of external space and other characteristics of dwelling. Labels can be used to annotate the drawings where necessary as part of analysis.

Instructions:

Step 1: Householders or focus groups are invited to a location to be a part of an exercise in designing their 'dream house'. Alternatively, facilitators can visit households direct, working with an individual or a family.

Step 2: Participants are provided with paper and drawing utensils and asked to draw their 'dream house'.

Step 3: Facilitators oversee the excercise and discuss the decisions for and the thought process of the design of their house. Notes are taken.

Step 4: Facilitators can help to visualise the ideas expressed by drawing or discussing solutions to problems that they may have., so conversation one-to-one may is appropriate here.

Step 5: Drawings are appropriately labelled with; name, age, gender and location.

Step 6: Multiple drawings are collected and cross examined for general ideas.

I took these goals as a foundation and carried them into the prototyping process. Reflection, imagination, and expression continued, but now through making, not just drawing. The aim stayed the same: to give children space to shape their world.

A drawing exercise to understand what residents consider their 'dream house' to be.

Goal: To understand the qualities valued and/or wanted/required in dwellings.

Audience: Typically householders. Any undermined groups or groups in need i.e. the disabled (mixed age and genders).

What you need:
- Drawing paper
- Drawing pens and pencils
- Coloured pencils
- Note paper
- Labels/Post-It notes
- A suitable location with a flat surface

I shifted the focus from materials to mindset. What was needed for prototyping wasn't just tools, but time, trust, flexibility, and respect for what children bring into the process.

I restructured the fixed steps into three open phases: Exploration, Co-Designing, and Prototyping. Prototyping didn't follow a linear path, but grew through testing, conversation, and shared decision-making.

Instructions:

Step 1: Householders or focus groups are invited to a location to be a part of an exercise in designing their 'dream house'. Alternatively, facilitators can visit households direct, working with an individual or a family.

Step 2: Participants are provided with paper and drawing utensils and asked to draw their 'dream house'.

Step 3: Faciliators oversee the excercise and discuss the decisions for and the thought process of the design of their house. Notes are taken.

Step 4: Facilitators can help to visualise the ideas expressed by drawing or discussing solutions to problems that they may have., so conversation one-to-one may is appropriate here.

Step 5: Drawings are appropriately labelled with; name, age, gender and location.

Step 6: Multiple drawings are collected and cross examined for general ideas.

(Architecture Sans Frontières UK, 2014-a)

Child Participatory Prototyping: A Practical Guide

Principles for Working in Under-Resourced School Contexts

Figure 123 Guide Title Page

This guide shares key reflections and considerations from a Child Participatory Prototyping process conducted in a public primary school in Siaya Town, Kenya. It is intended for designers, educators, and researchers working with children in under-resourced contexts, particularly those interested in empowering children as active co-creators of their environments.
Rather than telling you how to run your workshops, this guide invites you to consider what to be aware of when stepping into contexts shaped by material scarcity, cultural difference, and historic inequality.

Why Child Participatory Prototyping?

Child Participatory Prototyping isn't just a method or tool. It is an approach that combines co-creating and co-building with children. This approach offers a way to move from more abstract co-designing to actual full-scale prototyping. It enables children to test, shape and realise their own ideas and fosters ownership, agency and creativity. In postcolonial context it also becomes a strategy to shift power and empower local voices.

Many different authors describe child participation in several ways that shaped this guide's view. As for Duramy and Gal (2020), note that participation becomes meaningful when children are included and influence the entire design process, not only the idea-shaping phases. Tangen (2008) on the other hand, emphasizes the importance of giving space for children to express themselves beyond words using drawing and modeling to overcome hierarchical systems. And Tuhiwai Smith (2012) reminds us that to overcome postcolonial structures, participation processes must center lived experiences and local knowledge. Together, these views underpin the values and methods that shaped the development of this guide.

This guide is grounded in a specific context and set of values. It responds directly to colonial design traditions that still shape many public institutions. It proposes a grounded, responsive, and child-led method to shift that legacy toward collaboration and agency.

Building on Existing Tools

This guide builds on the participatory Toolbox by Architects Without Borders (ASF), which focuses primarily on workshops for earlier stages like Exploaring and Co-Designing. These sheets are sorted by different topics like, Mapping the Context, Identifying Risks & Agency, Dreaming, Developing Options, and Defining Routes (Architecture Sans Frontières UK, n.d.). However, they do not offer detailed guidance on full-scale prototyping with children. This guide attempts to fill that gap by adding another tool sheet to the toolbox collection for Architects Without Borders (ASF).

Ground Principles

Building a trusting environment and a positive relationship with the participating children is the most important first step. That can be achieved by respecting local structures of authority and giving them time to warm up to new forms of engagement.

The children are co-creators, and their perspectives, lived experience, and creativity are of significant value to the work, since coming in as a researcher also reminds you that you're a visitor, still learning the nuances of the place and its people.

This idea builds on the theoretical work of the earlier mentioned scholars, embedding it directly into the practice by listening first, co-building, and trusting the lived experience of children.

When designing, stay aware of local materials, tools, and constraints. Stay responsive to the lived reality of under-resourced schools.

How Child Participatory Prototyping Works

This visual illustrates how Child Participatory Prototyping sits at the intersection of researcher, children, and prototyping. The method grows from collaborative processes where children actively shape their surroundings through prototyping, co-creation, creativity, and lived experience.

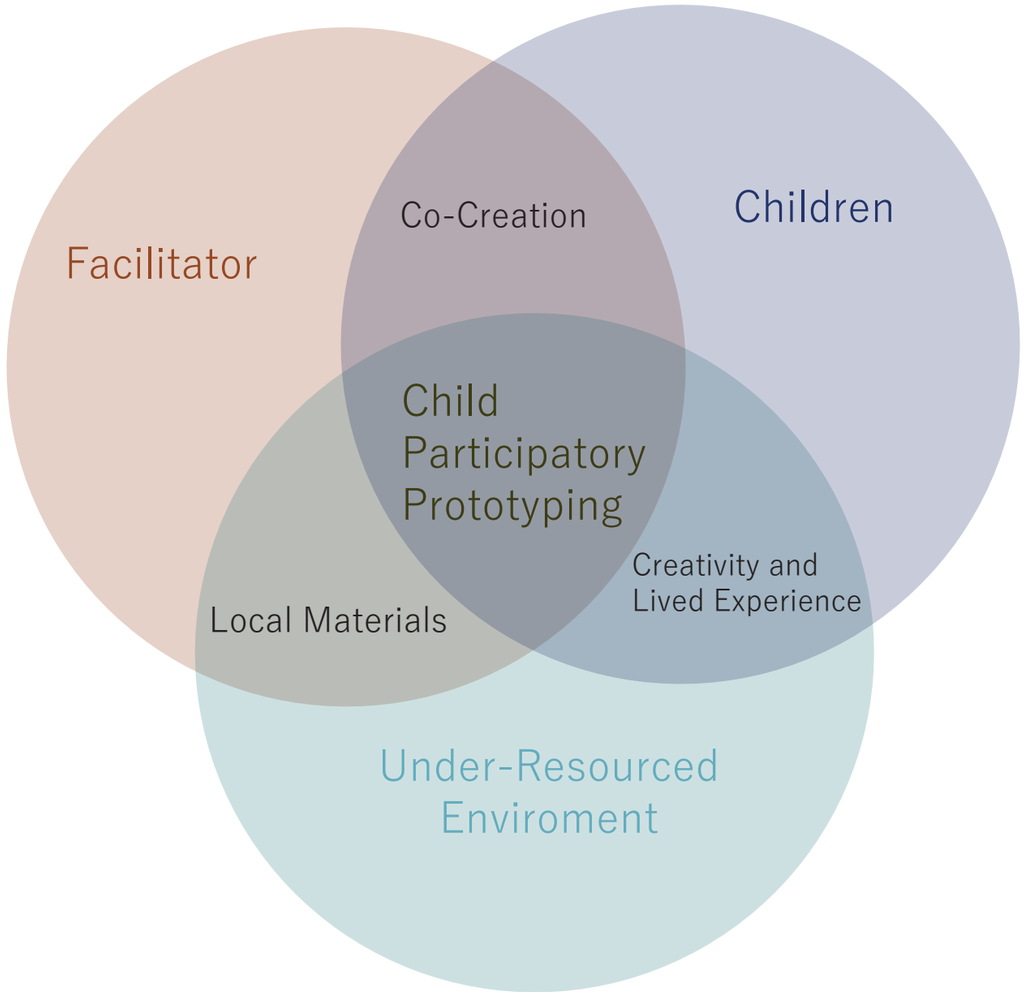
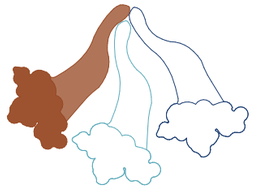


Figure 124 How Child Participatory Prototyping Works

The Process

Child Participatory Protoyping is rarely a straight path, and every project evolves in its own way. But the process can follow the three phases of Exploration, Co-Designing and Prototyping. These phases help you to build trust with the children, get to know the environment you‘re working in, learn about the children‘s thoughts and ideas, and create something meaningful that children feel proud of and connected to.

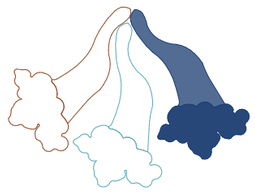


Exploration

A combination of getting to know each other, observation, and asking questions.

Co-Designing

Co-design works best when children feel that their ideas are taken seriously and lead to something they can see and touch.



Prototyping

What matters most is that the children feel ownership over what they’ve built, not because it’s perfect, but because it’s theirs.

Figure 125 The Process

Exploration

Begin with Listening, Not Planning

Entering a new environment with every step already decided may seem efficient, but it can limit your ability to respond. In contexts where you are a guest, it is more meaningful to begin with observation. Walk the school compound slowly. Sit where the children sit. Watch where they gather and where they avoid. Listen not only to what they say but also to how they move through space.

Avoid leading with solutions. Instead, start with curiosity and begin small. Get to know the names of the children, how they get to school and how long it takes them, and what languages they speak. Introduce yourself so they know who they are working with. Make it fun and give everyone time to say who they are. This sets the tone for all the workshops and shows that everyone will be heard.

Since sometimes talking and writing can be a difficult task for children who don‘t often get the chance to speak of their thoughts and ideas, drawing can be a good start to exploring the environment together. These drawings can be accompanied by questions from the researchers‘ site, but they should be open, not forcing in any particular direction.

So the first phase is a combination of getting to know each other, observation, and asking questions, setting a foundation for the Co-Design phase.

Co-Designing

Co-Designing Begins with Trust

Co-design does not begin with big ideas or perfect outcomes. It begins with trust, and trust takes time. In under-resourced schools, where routines are often strict and roles are clearly drawn, the invitation to create something together can be unfamiliar to children. Children may not be accustomed to being asked for their ideas, especially in formal learning environments. This means co-design is less about jumping into solutions and more about slowly growing confidence in expressing, in each other, and in the process itself.

Building tactile models can be a good way of sparking curiosity and creativity. By using materials they can find on school grounds, it gives them the freedom to decide how things should look and what they think is suited for a model. By using materials like clay that are easy to work with and malleable to anything, the children are free to explore different forms and shapes.

Co-design works best when children feel that their ideas are taken seriously and lead to something they can see and touch.

Prototyping

Turning Ideas into action

Prototyping brings ideas to life, but not in a polished, done version. It is less about precision and more about experimenting with materials and ideas. Children can test and build their ideas and see them becoming something real that they can touch and use.

When working with children, the choice of material is crucial. It needs to be materials that they can work with by themselves without a lot of external help. So materials that can be handled with small hand tools that aren‘t too dangerous are a safe choice. Prefabricating some parts that need to be handled with bigger machines should be considered. Also worth considering is to use materials that the children are familiar with, as this lowers the barrier to participation and builds confidence.

What matters most is that the children feel ownership over what they’ve built, not because it’s perfect, but because it’s theirs.

Working Safely with Children

- Set a tone where no idea is wrong and mistakes are okay. This encourages participation and reduces fear or shame during hands-on work and strengthens a safe feeling.
- Take time to introduce tools and supplies like hammers and nails carefully to the children. Make sure all children understand the importance of working carefully and with respect with these tools, so nobody will be harmed.
- The use of tools like electric drills must be under supervision at any time.
- Give the children the opportunity to swap tools with each other so everyone gets the chance to learn how to use them
- Always show how to use a tool properly before handing it over to the children.

Managing Crowds

When working with a school while school life is going on, it is important to be aware of the fact that most public schools in rural areas in countries like Kenya have a school population of over 1.000 students. As a white European researcher entering this setting, you will immediately become the center of attention. Everyone comes to say hi, and everyone starts following you and showing interest in what you are doing. That is why you are well advised to talk to the headmaster of the school beforehand and make sure you get a dedicated space that you can work in.

In this case it was a small room that had the possibility to be locked, which made storing materials over time easier. The room also had the feature of showing visible boundaries for children not involved in the process. By leaving windows and doors open, it gave them the opportunity to watch while not interfering too much with the ongoing process. Be respectful of the curiosity and excitement of the children not involved in the project; most of them would have loved to be part of it too, so at least let them watch.

When no room is available and you are the only researcher on site and all tasks fall back to you, it is advisable to connect with some of the older children around, explaining to them the importance of keeping distance while the participants are working with tools, and ask them to help you keep everyone at a distance. Make them your friends. Make sure to have a teacher as a contact person for worst-case scenarios when nothing works and nobody will listen. They know how to handle the crowd.

Checklist: What You Need Before Starting

- Permissions and ethical clearance: Get in contact with people on site and ask them about the requirements needed to be allowed to work with them and their school. In the case of Kenya, you need to send a document to the Ministry of Education that includes (student version):
- Contacts of all people involved
- Students‘ background(s)
- Proof of enrollment
- A writing from your professor stating your enrollment and explaining what you are doing
- Title and abstract of the research (preliminary)
- who the target group is
- Planned research methods
- The consent form that will be handed out to the participants

- Consent Forms: Filled out consent forms from all participating children/legal guardians, in which is stated what you are doing, what the children will be included in and how you handel the use of names, photos and materials of the children.

- One teacher as a contact person: It is advisable to get in contact with one of the teachers beforehand to have a contact person to turn to with questions on the school as well as help with the logistics and fitting you into the school curriculum.

- When and how long can your workshops be: Making sure to set times with the teachers before arrival so you know how long a workshop will be and you can plan a little bit ahead of time on what activities to fit in.

Planning for the Practical Side

Every project is unique and requires its own collection of materials. It is advisable to make a plan before going abroad about what materials might be needed or good to have and bring them with you. Things like colored pencils are always good to bring and also a great gift to leave with the children in the end. Here is a personal list on things used in this process. Another general tip is to bring some masking tape and markers for making nametaggs for everyone. That helps you remembering everyones name and also strengthens the sense of belonging to one team. In the following there is a list on what materials this process used in each of the phases alongside with things to watch out for and small tipps:

Phase	What to Do	Materials	Watch Out	Tips
Exploration	Drawing, Questions, Observation	Paper, color pencils	Children might hesitate to share their ideas verbally	Give them time, avoid pressuring
Co-Design	Modeling with clay and found objects	Clay, leaves, sticks, stones, waste	Children copying each others ideas	Emphasize originality
Prototyping	Build with recycled and local materials	Car tires, wood, rope, nails and hand tools	Safety risks, theft	Assign clear roles and rotate groups to avoid crowding

Figure 126 Diagram

What I Wish I Knew Before Starting

- Working alone means carrying everything at once and it changes the work. Being the only facilitator, designer, photographer, carpenter, and responsible adult meant I was constantly switching roles. There’s beauty in that intimacy, but also exhaustion. Every conversation, every mistake, every breakthrough runs through you. It made some moments feel deeply connected — and others completely overwhelming. If you can, find someone to share the load. Not just for logistics, but for reflection, safety, and presence.

- Being a guest changes everything. As a white European researcher in a Kenyan public school, I was always visible. Sometimes that meant curiosity, sometimes expectation, sometimes projection. I learned to carry this awareness gently but steadily. It reminded me to listen more than I spoke, to build trust slowly, and to constantly ask myself: who is this for, and who decides?

Golden Rules

1. Don’t overplan – let the children lead

2. Use what’s already there

3. Observe more than you talk

4. Build with, not for

5. Children find their voice by building, not just talking

Final Words

This guide is not finished, and it shouldn’t be. Every new school, every group of children, and every facilitator will shape it differently. Let it grow. Add your own reflections. That is the spirit of Child Participatory Prototyping: to build together, learn together, and leave space for what’s yet to come.

CHILD PARTICIPATORY PROTOTYPING

TOOL SHEET

Principles for under-resourced school enviroments

Context
This toolkit is for designers, educators, and researchers working with children in under-resourced school settings.

Goal
To support processes where children become active co-creators of their learning environments through exploration, design, and hands-on prototyping.

What You Need

- Space to listen
- Time to adapt
- Respect for what you don’t yet understand
- Comfort with unfinished plans
- Trust in the process
- Humor to keep a good spirit

Safety Tips

- Introduce all tools slowly and clearlydemonstrate first.
- Supervise children when using sharp or heavy tools.

Choosing Materials for Prototyping

When working in under-resourced contexts, materials should be familiar, safe, and easily available. Instead of giving exact items, here are guidelines for choosing what to work with:

Look for materials that are:
- Locally available (can be found on-site or nearby)
- Free or low-cost (recycled, donated, or scrap)
- Familiar to children (they’ve seen or used them before)
- Safe to handle (no sharp edges, not chemically treated)

Categories to consider:
- Drawing: paper, colored pencils, chalk
- Modeling: clay, cardboard, things found n site
- Building & Prototyping: tires, wood, ropes
- Tools: hand tools like hammers, scissors, screwdrivers

Supporting Items: tape, string, nails, markers

Tip:
Don’t plan everything in advance. Observe what’s around, ask the children what they use or find interesting, and build from there.

- Allow only a few children at a time to use tools to avoid crowding.
- Designate a clear area for tool use and keep it organized.
- Encourage children to ask for help instead of guessing.

If You’re Guiding the Work

- start small, build trust
- be patient, stay curious
- use what‘s available; avoid over structuring
- Let children lead where possible
- Prepare to adapt in the moment

Key Concideration

- observe first, plan second
- Invention grows from relationships and co-creating
- Prototyping is not just a method, it is how ideas take shape

Figure 127-128 Tool Sheet

Process Overview
This process involves three phases that invite children to shape their school environment through exploring, co-creating, and making.

Exploration

- Begin with curiosity, not predetermined plans
- Observe how children use and move through spaces
- Ask open questions, allowing ideas to emerge

Co-Designing

- Build trust first; take time to understand children’s perspectives
- Model with familiar materials that can be found in the schoolyard
- Let their ideas lead; be a partner, not an authority

Prototyping

- Turn concepts into tangible models using local, recycled materials
- Involve children in hands-on building together and testing
- Keep the process open to change, and value small wins
- Help children reflect on what works, not just what looks finished

The process matters more then the product!

Reflection

Figure 129 Reflection

Answering the research question

How to create outdoor school environments through Child Participatory Prototyping in under-resourced contexts?

When creating something through co-creation, the most important thing is to work together and listen to each other. Good collaborations require trust between the researcher and the participants so that everyone feels safe to openly share their thoughts, opinions, and ideas. In the context of Child Participation, this becomes even more important. The primary goal here is to listen to the children's voices, be guided by their ideas, and allow them to become active contributors. Beyond that, distributing decision-making power between children and adults fosters mutual learning on both sides.

When working with children in postcolonial settings, it is crucial to acknowledge that legacies of hierarchy and control persist. The children might not be used to being asked for their opinions, making them feel unsure on what to respond or making them perform according to what they think is expected from them. Therefore, it's important to create space for non-verbal expressions like drawing and modeling to make sure that they freely express their thoughts and ideas. The researcher needs to be culturally aware and should avoid the assumption that "participation" looks the same everywhere, making sure to center child lived experiences and not abstract ideas of empowerment. Participation arises when children feel that their ideas actually shape the outcome.

By adding Prototyping to Child Participation the method becomes an empowering tool to tackle traditional top-down school designs. Prototyping creates a process where children can test, adapt, and physically engage with their ideas. The work becomes a hands-on conversation between the researcher and the children rather than finalizing plans behind closed doors. When children develop concepts based on their own experiences, the final design is something they can relate to on a deep level and is influenced by their needs rather than predetermined models. This creates a strong sense of ownership in the spaces they help create, in addition to producing more relevant results. Prototyping serves as both an engagement strategy and the basis for a useful manual that was created in this thesis using the process's experiences, results, and reflections.

This integration of prototyping into participatory design also reflects a deliberate methodological stance shaped by postcolonial critique. The method challenges inherited top-down structures by centering children's lived realities rather than abstract ideals of empowerment. As a white European researcher in a Kenyan school, it needs to be reflected on how my presence could reproduce implicit power hierarchies. Learning to observe more, plan less, and create space for the learners to lead, this awareness became essential to co-creating rather than directing.

Working in an under-resourced context means that key resources like material, infrastructure, and funding are limited. That also means that the researcher needs to become creative with the choice of materials to make it possible for the community on site to continue with the work once the person leaves. Therefore, it is advisable to work with locally available materials, materials that you can find on the side of the road, materials that are recycled, and materials that the children are familiar with. When children build with things they recognize, like sticks, wood, sand, old car tires, leaves, and stones, the boundary between "designer" and "child" starts to dissolve. This makes participation more accessible and less intimidating. Additionally, it promotes a mindset of resilience, adaptation, and reuse, demonstrating that meaningful design relies on teamwork and creativity rather than costly resources. The idea that the built environment can develop from what already exists and that change can occur through small, group actions is reinforced by prototyping with such materials.

This method demonstrates that when children are trusted as designers, significant change in the outdoor school environment can occur even in settings with limited resources. What matters most is not scale or funding, but the strength of relationships, creativity, and openness toward the process.

The practical guide developed as part of this thesis is rooted in real experiences, showing how child-led insights, local materials, and hands-on experimentation can inform design steps that others can adapt to their own low-resource settings. It includes guidance on building trust, facilitating exploratory drawing activities, selecting familiar and locally available materials, and structuring workshops into the three iterative phases of exploration, co-design, and prototyping.

How do learners and teachers perceive and experience their school environment, and what becomes visible through observation?

In order to answer this question, one must dive a bit deeper into the topic of specific methods and tools. A key challenge behind this question is how the perceptions and experiences of students and teachers can actually be captured or made visible.

Workshops that address topics like exploring and storytelling can reveal a lot about how students and teachers perceive and experience their school environment. However, it only reveals a fraction of what the participants allow and want you to see. On another note, the way questions are asked, received, and understood also plays a big part in the matter of gaining the knowledge of how they perceive and experience their environment. That's why questions must be clearly and simply formulated and tailored to the people you're working with are the key to being able to understand how participants perceive and experience their environment. These questions don't always have to be answered through words and writing; simple tools like drawing and modeling can help the participants show their thoughts and ideas, making it easier for them to express themselves. When working with adults like teachers, methods like walking and talking can add a more adult perspective, focusing more on the infrastructure, under-resourced staff, and missing parts to follow the national school curriculum.

Observation is another valuable method, though it must be used with care because the researcher needs to stay neutral while observing the environment. One should take everything in before jumping to conclusions. By observing and spending time in the environment, you begin to understand a lot, including things that may not be said aloud in workshops. It allows you to see how spaces are actually used, which areas are avoided, and how children and teachers navigate through their surroundings. You begin to notice patterns: where shade is sought, where children gather during breaks, where they eat their lunch, and where they go to play. In this way, observation complements participatory methods by revealing silent but important aspects of the everyday school experience. One aspect that must be considered is that the presence of a researcher on site may influence how children and teachers behave, as they might try to present themselves or the school in a particularly positive light, subtly shaping what is observed.

In this case, learners revealed a strong need for shaded seating, space to play, and areas where they could rest or socialize. These needs became visible not just through their words, but also through their drawings, models, and the priorities they gave in discussions. Observation helped confirm these insights, especially when students gathered in the few shaded areas available, sitting in the dust or on roots of trees. Together, these tools created a fuller picture of how the school environment is experienced every day and what changes might matter most to the children.

What materials, methods, and conditions support safe, inclusive, and locally grounded Co-Design with children?

Creating a safe and inclusive environment for children in co-design projects begins with building trust. This requires time, presence, and consistency. In the case of Awelo School, trust was developed through repeated workshops and playful activities. By creating a space where learners could express themselves without pressure, it was ensured that everyone‘s ideas were heard. The workshop room, name tags, regular meeting times, and open conversations helped shape that safe environment.

Safety also means physical safety. All tools and materials used in the workshops were chosen carefully to avoid harm. Materials like clay, wood waste, sugarcane fibers, old tires, sand, wood, and rope were used because they were either soft, natural, or already familiar to the children. Tools like hammers, saws, and drills were introduced slowly and always under supervision. All tasks that were too dangerous, like cutting car tires, were done by a local craftsman. Clear instructions and safety rules were part of the workshops, making sure that all children understood the importance of using the tools carefully and with respect.

To support inclusive participation, the workshops used creative methods like drawing and modeling. These methods allowed children to express their ideas visually and physically, making it easier for the children to show their thoughts without having to verbally express them.

The materials that were chosen in the process were not only safe and accessible but also locally available and affordable or even free. This grounded the work even more in the under-resourced school environment and made it easier for the children to relate to.

The fieldwork at Awelo was supported by the school community and teachers, who provided a dedicated workshop room, creating a safe space for the collaborative work with the children. The work was always planned in a way that respected the school routine and made space for the children to participate voluntarily and without pressure.

Safe, inclusive, and locally grounded co-design is only possible when children are given time, tools, and trust to take part in shaping their own environment. This requires careful planning, cultural sensitivity, and a willingness to adapt to the realities of the place.

What the Research Contributes

In this research, a new methodological term has been developed. The term is an expansion of the concept of Child Participatory Design including Prototyping, a more practical method in the approach. Out of this methodology and method, the new term Child Participatory Prototyping emerges. This methodology brings together hands-on prototyping, co-designing, and context-sensitive engagement into one evolving process that empowers children to influence their environment beyond just asking for their opinions but actually letting them be co-designers.

Child Participatory Prototyping also responds to postcolonial conditions, where design processes as well as school systems are often connected with respect for authority and top-down decision-making structures. These systems limit the participation and co-creation. By focusing on the child‘s expressed ideas and lived experience, this thesis shifts those dynamics to a bottom-up approach where everyone has a say.

This shift not only repositions children as active agents in the design process, but also challenges inherited structures by grounding design in shared authorship and lived reality. Additionally, this project contributes to the field by demonstrating how prototyping can be used as a process of co-creation rather than co-designing. While prototyping in relation to children is often used in the co-design phase of a process, using low-tech prototyping as a method for producing small scale models, this thesis works with full-scale prototyping, showing that it is possible to include children even in the 1:1 scale.

One of the central outcomes of this thesis is the development of a practical guide on Child Participatory Prototyping. It is intended to support other designers, educators, or researchers working with children in under-resourced environments by offering an adaptable structure rooted in lived experience. The guide complements the theoretical contributions by translating them into actionable tools for practice.

Together, these contributions demonstrate that child participation in design can be deepened through hands-on prototyping and grounded in a methodology that is both context-sensitive and practically applicable.

The tool sheet developed from this research is context-specific in its roots but adaptable in its structure. While grounded in the material and social realities of Awelo School, it can be used in other under-resourced educational settings. It focuses on using local materials, building trust, and working step by step, which makes it especially useful in settings where people are open to collaboration and where resources are limited. However, the guide is not universally applicable without modification; its strength lies in being adaptable, not in providing fixed steps.

Limitations and Future potential

This research is filled with valuable insights on Child Participatory Prototyping but it also brought up some limitations that shaped the process and its outcomes, especially on-site. Time was one constraint. Developing trust and relationships between students and researchers takes time, and working alone makes things go slower than working in a team.

Working alone in general is a challenge, especially on a large school compound with over 1.600 children. The visibility of the project and the researcher created constant attention. Children surrounding the activities out of curiosity or excitement made work difficult at times and influenced the behavior of participants during the workshops. Some children tended to talk to others and got distracted, and others became shy and didn‘t dare to do their work because children were laughing. When being alone, this means all things are happening at the same time. The workshop needs to continue, and questions of the students regarding the tasks need to be answered. Help must be there when it is needed. Having an eye on everyone working with tools must be granted at all times. And finally, the children who came to watch need to be addressed and told to give enough space and stop laughing about participants.

Another aspect that needs to be addressed is the fact of being a white European researcher in a Black Kenyan school community. Entering a completely different context requires time to become familiar with the environment and build understanding. The presence of a white person often raises expectations of support. The fact that a researcher is on site also means that the school most likely presents itself in the best way, and these dynamics can‘t be fully untangled from the researcher‘s perspective but need to be acknowledged.

The practical guide that was introduced and presented in this thesis is grounded on the research and experience from fieldwork, but it has not yet been tested in different context than the one it was created in.

The limitations were real and sometimes difficult, but they didn’t diminish the value of the work; they shaped it and pointed clearly toward what can grow next.

There is potential for the ideas and the way of working with the children to continue at Awelo, but it would need a teacher who is willing and able to continue this kind of work. The room for the workshop is an empty room that is currently not used by any class, so it could be further transformed into some sort of workshop space even though it is a small room. But one big limitation that comes with this kind of hands-on work is that it needs somebody to supervise the children at all times. The classes have a size of around 70 students, making it nearly impossible to work alone with one class when it comes to involving tools. Without a committed teacher or external support, however, it is unlikely that this way of working can continue on its own. There is hope that the involved students from the workshop are able to repair things later when they break with the remaining tools at school.

This thesis introduced Child Participatory Prototyping as a flexible and responsive method for engaging children in transforming their own learning environments.

The Practical Guide developed through this research is more than documentation. It offers a tool sheet that others can adapt to their projects. Because it is based on low-cost, familiar materials and emphasizes the process over the outcome product, the approach can be scaled across diverse, under-resourced schools.

The creation of a living tool sheet is making it a collective and evolving practice that future facilitators can adapt and add to.

In the end, the potential of Child Participatory Prototyping lies not in rolling out a fixed model, but in building spaces that reflect children’s voices, foster ownership, and support agency, wherever the work is taken next.

Its future value rests in how openly it invites others to adapt, evolve, and carry it forward, with the children always at the center.

Both the limitations and the future potential of this work show that meaningful participation doesn’t require perfection. It requires presence, care, and openness to learn with children.

As a next step, Child Participatory Prototyping could be tested in different environments, urban schools, other postcolonial contexts, or even in marginalized communities within high-income countries. These comparative studies would offer critical insight into the scalability and adaptability of the method and help refine the guide for diverse futures.

Figure 130 The End

Bibliography

Figure 131 Bibliography

Bibliography

Literature Bibliography

Books

Bishop, K., & Corkery, L. (Eds.). (2017). *Designing cities with children and young people: Beyond playgrounds and skate parks*. Routledge.

Branch, D. (2011). *Kenya: Between Hope and Despair, 1963-2011*. Yale University Press. http://www.jstor.org/stable/j.ctt1npwvg

Burry, M., & Burry, J. (2017). *Prototyping for architects*. Thames & Hudson.

Creswell, J. W., & Creswell, J. D. (2018). *Research design: Qualitative, quantitative, and mixed methods approaches (5th ed.)*. SAGE Publications.

Merriam, S. B., & Tisdell, E. J. (2015). *Qualitative research : A guide to design and implementation*. John Wiley & Sons, Incorporated.

Parsons, Timothy H., ‚British Kenya: The Short Life of the New Imperialism‘, *The Rule of Empires: Those Who Built Them, Those Who Endured Them, and Why They Always Fall* (New York, 2012; online edn, Oxford Academic, 16 Mar. 2015), https://doi.org/10.1093/acprof:osobl/9780199931156.003.0007.

Sheil, B. (2013). De-fabricating protoarchitecture. In M. Stacey (Ed.), *Prototyping architecture: The conference papers* (pp. 372–389). Building Centre Trust.

Journal Articles

Aboh, J. A., Ntui, D. O., & Odey, P. O. (2019). T*he Omani Empire and the development of East Africa. International Journal of Research in Humanities and Social Studies*, 6(7), 25–30. Retrieved from https://docslib.org/doc/806200/the-omani-empire-and-the-development-of-east-africa

Adebisi, F. (2016). *Decolonising education in Africa: Implementing the right to education by re-appropriating culture and indigeneity*. Northern Ireland Legal Quarterly, 67(4), 433-451.

Arnstein, S. R. (1969). A ladder of citizen participation. Journal of the American Institute of Planners, 35(4), 216–224. https://doi.org/10.1080/01944366908977225

Berman, B. J. (1976). *Bureaucracy and incumbent violence: Colonial administration and the origins of the ‚Mau Mau‘ emergency in Kenya*. British Journal of Political Science, 6(2), 143-175. https://www.jstor.org/stable/193615

Blanchet-Cohen, N., Cooper, A., & Doel-Mackaway, H. (2023). *(Re)Imagining children's participatory rights with decolonial learning*. O Social em Questão, 26(56), 61–88. https://doi.org/10.12957/osq.2023.71748

Budde, R., Kautz, K., Kuhlenkamp, K., & Züllighoven, H. (1992). *What is prototyping? Information Technology & People*, 6(2-3), 89–95. https://doi.org/10.1108/eum0000000003546

Druin, A. (2002). *The role of children in the design of new technology*. Behaviour & Information Technology, 21(1), 1–25. https://doi.org/10.1080/01449290110108659

Duramy, B. F., & Gal, T. (2020). *Listening to children's voices in educational research: Some theoretical and methodological problems*. Children's Rights Law Review, 1(1), 3–17. https://doi.org/10.1163/25897449-00101002

Duramy, B. F., & Gal, T. (2020). *Understanding and implementing child participation: Lessons from the Global South*. Children and Youth Services Review, 119, 105645. https://doi.org/10.1016/j.childyouth.2020.105645

Hansen, N. B. (2017). *Materials in participatory design processes* [Doctoral dissertation, Aarhus University]. arXiv. https://arxiv.org/abs/1703.07187

Hart, R. A. (1992). *Children‘s participation: From tokenism to citizenship*. UNICEF Innocenti Research Centre. https://www.researchgate.net/publication/24139916

Held, M. B. E. (2019). *Decolonizing research paradigms in the context of settler colonialism: An unsettling, mutual, and collaborative effort*. International Journal of Qualitative Studies in Education, 32(3), 235–256. https://doi.org/10.1080/09518398.2018.1540037

Inyega, J. O., Arshad-Ayaz, A., Naseem, M. A., Mahaya, E. W., & Elsayed, D. (2021). *Post-independence basic education in Kenya: An historical analysis of curriculum reforms*. FIRE: Forum for International Research in Education, 7(1), 1–23. https://doi.org/10.32865/fire202171233

Iversen, O. S., Dindler, C., & Smith, R. C. (2010). *Participatory design at the museum: Inquiring into children's everyday engagement in cultural heritage*. In Proceedings of the 22nd Conference of the Computer-Human Interaction Special Interest Group of Australia on Computer-Human Interaction (pp. 72–79). ACM. https://doi.org/10.1145/1952222.1952239

Kawulich, B. B. (2005). *Participant observation as a data collection method*. Forum Qualitative Sozialforschung, 6(2), 22. https://doi.org/10.17169/fqs-6.2.466

Kiiru, M. (2004). *Kenyan literature: A call for discourse*. The Nairobi Journal of Literature, (2), 66–74. https://erepository.uonbi.ac.ke/handle/11295/29637

Kimari, W. (2017). *We do not want any more masters: Ruins, planning and the messy labours of the urban poor*. International Development Planning Review, 39(2), 129–148. https://doi.org/10.3828/idpr.2017.9

Kirjavainen, A., Nousiainen, T., & Kankaanranta, M. (2005). *Prototyping in educational game design. Proceedings of CHI 2006, Player-Centred Game Design Workshop*. Retrieved from https://www.researchgate.net/publication/228864976

Lockwood, P. (2023). *‘Hustlers vs dynasties’: Confronting patrimonial capitalism in Kenya‘s 2022 elections*. Anthropology Today, 39(5), 7–10. https://doi.org/10.1111/1467-8322.12836

Lonsdale, J., & Berman, B. (1979). *Coping with the contradictions: The development of the colonial state in Kenya, 1895-1914*. The Journal of African History, 20(4), 487–505. https://doi.org/10.1017/S0021853700017403

Maangi, E. N. (2024). *African indigenous knowledge systems: Assessing the training of the Gusii children during the pre-colonial period. International Journal of Research and Innovation in Social Science*, 8(9), 3315–3318. https://ideas.repec.org/a/bcp/journl/v8y2024i9p3315-3318.html

Mackatiani, C., Imbovah, M., Imbova, N., & Gakungai, D. K. (2016). *Development of education in Kenya: Influence of the political factor beyond 2015 MDGs*. Journal of Education and Practice, 7(11), 55–60. https://files.eric.ed.gov/fulltext/EJ1099584.pdf

Martin, B., & Hanington, B. M. (2012). *Universal methods of design: 100 ways to research complex problems, develop innovative ideas, and design effective solutions*. Choice Reviews Online, 49(10), 49–5403. https://doi.org/10.5860/choice.49-5403

Meyiwa, T., Ntuli, M., & Mhlanga, B. (2020). *Decolonising research methodologies: Lessons from a qualitative research project, Cape Town, South Africa*. Alternation, 31(2), 159–184. https://doi.org/10.29086/2519-5476/2020/v31n2a7

Motala, S., & Williams, J. (2021). *Students as co-researchers: Participatory methods for decolonising research in teaching and learning in higher education*. Critical Studies in Teaching and Learning (CriSTaL), 9(2), 1–17. https://doi.org/10.14426/cristal.v9i2.470

Newsinger, J. (1981). *Revolt and repression in Kenya: The ‚Mau Mau' rebellion, 1952-1960*. Science & Society, 45(2), 159-185. https://www.jstor.org/stable/40402312

Nkinyangi, J. A. (1982). *Development policy and the evaluation of community self-help: The Harambee school movement in Kenya. Studies in Comparative International Development*, 17(1), 22–43. https://doi.org/10.1007/BF02686385

Nyamwange, C. (2020). *Competence based curriculum implementation since 2018 to 2020 in Kenya: A review of current status. The Cradle of Knowledge: African Journal of Educational and Social Science Research*, 8(4), 133–140. https://www.serek.or.ke

Okorn, N. D., A, A. J., & Odey, P. O. (2020). T*he Omani Empire and the Development of East Africa*. International Journal of Arts and Humanities, 4(6), 163–172. https://doi.org/10.46609/ijah.2020.v04i06.002

Olweny, M. (2023). *The foreign and the local in architectural education in late colonial and post-independence East Africa*. Journal of Architecture and Urbanism, 47(1), 1–15. https://doi.org/10.3846/jau.2023.17053

Onyango, M. O. (2020). *Family socio-economic status and students' participation in education in Siaya County, Kenya. International Journal of Research in Education and Social Sciences*, 3(4), 22–35. https://www.academia.edu/63651852/Family_Socio_economic_Status_and_Students_Participation_in_Education_in_Siaya_County_Kenya

Parashar, S., & Schulz, M. (2021). *Colonial legacies, postcolonial 'selfhood' and the (un)doing of Africa*. Third World Quarterly, 42(5), 867–881. https://doi.org/10.1080/01436597.2021.1903313

Pradines, S. (2016). *Portuguese fortresses in East Africa*. Fort, 44, 47–75. https://www.researchgate.net/publication/341940582

Schepers, S., Dreessen, K., & Zaman, B. (2018). *Rethinking children's roles in Participatory Design: The child as a process designer*. International Journal of Child-Computer Interaction, 16, 47–54. https://doi.org/10.1016/j.ijcci.2017.12.001

Tangen, R. (2008). *Listening to children's voices in educational research: Some theoretical and methodological problems*. European Journal of Special Needs Education, 23(1), 17–27. https://doi.org/10.1080/08856250801945956

Uduku, O. (2018). *School design in Africa: the background. International Journal of Educational Development*, 58, 31–40. https://doi.org/10.1016/j.ijedudev.2017.02.002

Van Dooren, E., Boshuizen, H., van Merriënboer, J., Asselbergs, T., & Dorst, K. (2014). *Making explicit in design education: generic elements in the design process*. International Journal of Technology and Design Education, 24, 53–71. https://doi.org/10.1007/s10798-013-9246-8

Van Mechelen, M., Bleumers, L., Vandewaetere, M., & De Grove, F. (2019). *Designing the Internet of Toys for Children's Educational Development*. In M. Foth et al. (Eds.), Perspectives on HCI Research with Children (pp. 93–114). Springer. https://doi.org/10.1007/978-3-030-15557-4_5

Websites

Architecture Sans Frontières UK. (2014-a). *Dreaming through drawing*. ASF Participate. Retrieved May 10, 2025, from http://www.asfparticipate.org/dreaming/dreaming-through-drawing/

Architecture Sans Frontières UK. (2014-b). *Dreaming through modelling*. ASF Participate. Retrieved May 10, 2025, from http://www.asfparticipate.org/dreaming/dreaming-through-modelling/

Architecture Sans Frontières UK. (2014). Participatory design tools. https://www.asf-uk.org/pages/112-tools

Architecture Sans Frontières UK. (2014-c). *Walking & talking*. ASF Participate. Retrieved May 10, 2025, from http://www.asfparticipate.org/getting-to-know-the-context/walking-talking/

Black History Month. (n.d.). *The colonisation of Kenya*. Black History Month UK. Retrieved May 10, 2025, from https://www.blackhistorymonth.org.uk/article/section/african-history/the-colonisation-of-kenya/

Bookey. (n.d.). *Mwai Kibaki quotes*. Bookey. Retrieved May 10, 2025, from https://www.bookey.app/quote-author/mwai-kibaki

Cambridge Dictionary. (2025). *Participation*. Retrieved May 10, 2025, from https://dictionary.cambridge.org/dictionary/english/participation

Cambridge University Press. (n.d.). *Prototype*. In Cambridge Dictionary. Retrieved May 10, 2025, from https://dictionary.cambridge.org/dictionary/english/prototype

Chalmers University of Technology. (2024). ACE570: Reality Studio – Course syllabus. https://www.chalmers.se/en/education/your-studies/find-course-and-programme-syllabi/course-syllabus/ACE570/

Cole, A. (2023).*Ethnic Groups in Kenya Overview & Facts*. Study.com. Retrieved May 10, 2025, from https://study.com/academy/lesson/kenya-ethnic-groups.html

Encyclopædia Britannica. (n.d.). *Kenya - Colonialism, Mau Mau, Independence*. Britannica. Retrieved May 10, 2025, from https://www.britannica.com/place/Kenya/World-War-II-to-independence

Expat Arrivals. (n.d.). *A brief history of Kenya*. Expat Arrivals. Retrieved May 10, 2025, from https://www.expatarrivals.com/africa/kenya/brief-history-kenya

History.com Editors. (n.d.). *Kenyatta freed*. History. Retrieved May 10, 2025, from https://www.history.com/this-day-in-history/kenyatta-freed

HistoryWorld. (n.d.). *History of Kenya*. Retrieved May 10, 2025, from https://historyworld.net/history/Kenya/758

Kenya Institute of Curriculum Development. (n.d.). *Kenya Institute of Curriculum Development*. Retrieved May 10, 2025, from https://kicd.ac.ke/

Komu, N. (2025, March 3). "*Wildlife corridors" are encouraged to support Kenya's recovering animal populations* | AP News. AP News. Retrieved May 10, 2025, from https://apnews.com/article/kenya-wildlife-corridors-lewa-conservancy-0887bee524258ce5fa96b5875b106b24

Ministry of Education. (2018). *Re-alignment of the education sector to the Constitution of Kenya 2010 and Vision 2030 and beyond*. Nairobi: Government of Kenya. Retrieved May 10, 2025, from https://vision2030.go.ke/

Musambi, E. (2025, March 4). *Refugees injured in clashes with Kenyan police during food ration protests* | AP News. AP News. Retrieved May 10, 2025, from https://apnews.com/article/kenya-refugees-kakuma-dadaab-unhcr-fd2618c92e22270e71c307b8e7ba2547

Presidential Library of Kenya. (n.d.). *Legacy, achievements, and challenges*. Retrieved May 10, 2025, from https://www.presidentiallibrary.go.ke/legacy-achievements-and-challenges?utm_source

Republic of Kenya. (n.d.). *School infrastructure standards and guidelines*. Kenya Development Response to Displacement Impacts Project (KDRDIP). Retrieved May 10, 2025, from https://kdrdip.go.ke/school-infrastructure-guidelines/

Siaya Township Location Schools | ShuleZote. (n.d.). Retrieved May 10, 2025, from https://shulezote.co.ke/place/location/karemo/siaya-township/?utm_source.com

South African History Online. (n.d.). *Kenya*. South African History Online. Retrieved May 10, 2025, from https://sahistory.org.za/place/kenya

Teachers Arena. (2022). *How CBC is organized from pre-primary to senior secondary plus core subjects offered*. Retrieved May 10, 2025, from https://arena.co.ke/how-cbc-is-organized-from-pre-primary-to-senior-secondary-plus-core-subjects-offered/

World Atlas. (n.d.). *How did Kenya get its name?* Retrieved May 10, 2025, from https://www.worldatlas.com/articles/how-did-kenya-get-its-name.html

Reports and Other Documents

Awelo School. (2024). *Field notes and school information*[Unpublished internal document]. See Appendix C.

Kenya Vision 2030 Delivery Secretariat. (2022). *Kenya Vision 2030: Flagship programmes and projects progress report*. Government of Kenya. https://vision2030.go.ke/publication/kenya-vision-2030-flagship-programmes-and-projects-progress-reports/

Republic of Kenya. (n.d.). *Kenya Development Response to Displacement Impacts Project (KDRDIP): School infrastructure standards and guidelines*. Executive Office of the President, Department for Development of Arid and Semi-Arid Regions. https://www.kdrdip.go.ke/wp-content/uploads/2021/03/KDRDIP-School-Infrastructure-Standards-and-Guidelines.pdf

The National Treasury and Economic Planning. (2024). *Fourth Medium Term Plan 2023-2027: Bottom-Up Economic Transformation Agenda for Inclusive Growth*. https://repository.kippra.or.ke/handle/123456789/4856

List of Figures

© Anjuli Grüschow
All used Images, Graphics, Photos and Plans in this thesis are created and owned by the author and the learners from the Awelo Workshops unless stated otherwise. No part of this work may be reproduced or used without explicit written permission from the author.

Appendix

Figure 132 Appendix

Appendix A

Ethical Clearance

Ethical Clearance

Anjuli Grüschow (Master Student)
Email: [anjuli@chalmers.se]

Liane Thuvander (Examiner)
Email: [liane.thuvander@chalmers.se]

Marli Swanepoel (Supervisor)
Email: [marlis@chalmers.se]

- Students Background:

  Anjuli Lara Deborah Grüschow

  2023-anticipated 2025
  Chalmers University of Technology
  M.Sc. Architecture and Planning Beyond Sustainability

  2022-2023
  Willen Associates
  B.Sc. Architect

  2019-2022
  Darmstadt University of Technology
  B.Sc. Architecture

  2016-2019
  Resch Innenausbau
  Apprenticeship as an interior Carpenter

- Proof of enrolment

CHALMERS
UNIVERSITY OF TECHNOLOGY

Certificate of Registration

Print date
2025-01-26

Name	Personal identity number
Anjuli Lara Deborah Grüschow	19970609-7061

The certificate includes registrations within the period 2023-09-01 - 2025-06-13

Registered on

Code	Name	Scope	Period	Notes
ACEX35	Master's thesis in Architecture *Rate of study: 100 %, Teaching hours: Day-time, Type of instruction: Normal teaching, Study location: GÖTEBORG*	30.0 hp	2025-01-20 - 2025-06-08	a
ACE560	Integrated sustainable building design, architects *Rate of study: 100 %, Teaching hours: Day-time, Type of instruction: Normal teaching, Study location: GÖTEBORG*	15.0 hp	2024-11-04 - 2025-01-19	a
ACE370	Master's thesis preparation: Academic approaches and general structure *Rate of study: 33 %, Teaching hours: Day-time, Type of instruction: Normal teaching, Study location: GÖTEBORG*	5.0 hp	2024-09-02 - 2024-11-03	a
ACE425	Master's thesis preparation: Design approaches and narratives *Rate of study: 67 %, Teaching hours: Day-time, Type of instruction: Normal teaching, Study location: GÖTEBORG*	10.0 hp	2024-09-02 - 2024-11-03	a
ACE570	Reality studio *Rate of study: 100 %, Teaching hours: Day-time, Type of instruction: Normal teaching, Study location: GÖTEBORG*	15.0 hp	2024-03-18 - 2024-06-02	a
ACE365	Hybrid practice of architecture *Rate of study: 33 %, Teaching hours: Day-time, Type of instruction: Normal teaching, Study location: GÖTEBORG*	5.0 hp	2024-01-15 - 2024-03-17	a
ACE410	Managing design projects *Rate of study: 67 %, Teaching hours: Day-time, Type of instruction: Normal teaching, Study location: GÖTEBORG*	10.0 hp	2024-01-15 - 2024-03-17	a

Check the certificate on: https://www.student.ladok.se/verifiera/
Verifiable until: 2025-04-26

Personal identity number: 19970609-7061
control code: 2BN0N263E2

Page 1 / 2

Code	Name	Scope	Period	Notes
ACE550	Design and planning for social inclusion *Rate of study: 100 %, Teaching hours: Day-time, Type of instruction: Normal teaching, Study location: GÖTEBORG*	15.0 hp	2023-10-30 - 2024-01-14	a
ACE380	Sustainable development and the design professions *Rate of study: 33 %, Teaching hours: Day-time, Type of instruction: Normal teaching, Study location: GÖTEBORG*	5.0 hp	2023-08-28 - 2023-10-29	a
ACE440	Beyond sustainability *Rate of study: 67 %, Teaching hours: Day-time, Type of instruction: Normal teaching, Study location: GÖTEBORG*	10.0 hp	2023-08-28 - 2023-10-29	a

Notes and information

60 credits (hp) represent a full academic year. The system is compatible with ECTS credits (the European Credit Transfer System) as one credit is equal to one ECTS credit.

Included in:

a MPDSD ARCHITECTURE AND PLANNING BEYOND SUSTAINABILITY, MSC PROGR (120.0 hp)

The above is an excerpt from the student records

Certificate for Anjuli Grüschow

I hereby certify that Anjuli Grüschow is enrolled in the course ACEX35Master's thesis, profile *Society, Justice, Space*, in the Master's Programme MPDSD *Architecture and planning beyond sustainability* at the Department of Architectural and Civil Engineering, Chalmers University of Technology (Chalmers).

As part of her Master's thesis with the preliminary title "Transforming Post-Colonial School Buildings in Africa - Sustainable and Locally-Sourced Construction Approaches for Improved Learning Environments", Anjuli will carry out field studies in Siaya, Kenya, during the period 10th February to April 11th 2025.

Chalmers and the Master's Programme MPDSD has established collaborations (agreement) with the Jaramogi Oginga Odinga University of Science and Technology (JOOUST) through the Master's course Reality Studio (RS). The RS works in real-world settings and an important part of the course are field studies. Anjuli is a former student of the RS and her Master's thesis builds on the excellent project work from the Reality Studio 2024 entitled "Children as designers. Participatory Design with Siaya's Young Learners". The Master's thesis provides a great opportunity to deepen the collaboration between JOOUST and Chalmers and further develop the project.

Regards

Liane Thuvander,

Professor in Architecture and Sustainable Building, examiner Master's thesis

ARCHITECTURE AND CIVIL ENGINEERING
Architectural theory and methods
Chalmers tekniska högskola
412 96 Göteborg
031-772 10 00
registrator@chalmers.se
www.chalmers.se

Chalmers tekniska högskola AB
Organisationsnummer: 556479-5598

CHALMERS

- The Preliminary title of the project

  Transforming Post-Colonial School Buildings in Africa - Sustainable and Locally-Sourced Construction Approaches for Improved Learning Environments

- Preliminary Abstract of the project

  This master‘s thesis explores the construction of post-colonial school buildings in Kenya with Awelo Primary School in Siaya as a field study. Furthermore, this thesis addresses the significant challenges facing education infrastructure in rural areas, including challenging learning environments, inadequate sanitation and the lasting effects of colonial-era designs that do not reflect local climate or cultural needs.

  The aim of this research is to propose design solutions that not only enhance the functionality and inclusivity of school buildings but also align with cultural traditions and sustainable practices. The study will be guided by theories of post-colonialism, sustainable design, educational Infrastructure and Learning Environments and Critical Spatial Theory. It seeks to understand how these architectural interventions can support equitable, inclusive education and promote gender equality, as well as improve student engagement and overall learning outcomes.
  This thesis explores the potential of existing school structures and how they can be improved through small-scale implementations and the use of local materials. Based in Siaya, Kenya this research directly addresses obstacles to overcome and engages with learners to find local solutions.

  The study aims to empower the learners and their community and create a sense of ownership in the design and construction process.The development of a handbook documenting the small implementations at the school is intended not only to benefit the students and community of Awelo but also to provide other schools with a practical guide for improving their buildings through small steps.

- Target group of research

  - 10-15 students of the 7th grade of Awelo Primary School
  - Benta Wanga (teacher at Awelo)
  - Guardians of the participants (parents or legal guardians) for consent.

- My planned research methods for the field Study

  - Problem finding Workshops through drawing, talking and modelling
  - Design Workshops in which the children can express their ideas and solutions in the form of drawings and modelling.
  - Prototyping trying out ideas for solutions the children and I had
  - Testing prototypes. Do they fulfill their purpose?
  - Building. Making more of one kind of the prototypes when the testing went good

- Process of receiving consent from participants, plus the informed consent form template that you will use in your study

The consent form will be sent out to the parents in advance, which includes details about the project, its purpose, and how their child’s work will be used.

Consent Form for Participation in Workshops and Use of Student Work

Participant Information: Name of Student: _____
Grade: _____

Project Title: Master's Thesis Field Study. Preliminary title: Transforming Post-Colonial School Buildings in Africa - Sustainable and Locally-Sourced Construction Approaches Through Community and Student Engagement

Researcher: Anjuli Grüschow, Master's Student at Chalmers University of Technology

---

Purpose of the Workshops: The workshops are part of a Master's thesis project focused on improving school buildings in Kenya, with Awelo Primary School as a case study. The aim is to address challenges like dust and mud by using small, sustainable solutions and local materials. Students and the community will be involved in the process to create practical improvements and help me develop a handbook that can guide other schools.

Your participation will help shape these designs and ensure they meet local needs while fostering a sense of ownership and pride in the results. Students will engage in interactive activities and contribute their ideas and work to the study.

What Participation Involves:

1. Students will take part in supervised workshops, which include [briefly describe activities, e.g., creative tasks, group discussions, or hands-on projects].
2. Photos may be taken during the workshops; however, **faces will not be shown** in any publication or presentation.
3. The students' work created during the workshops (e.g., drawings, written materials) may be included in the Master's thesis.

Confidentiality:

- No personal information (e.g., names, contact details) will be shared in any reports, presentations, or publications.
- All data collected will be used solely for academic purposes.

Rights of Participants:

- Participation is voluntary. Students and parents can withdraw consent at any time without any consequences.
- Students may refuse to participate in any specific activity during the workshops.

Declaration of Consent: I, the undersigned, hereby give consent for my child/the student under my guardianship to:

1. Participate in the workshops organized by Anjuli Lara Deborah Grüeschow as part of her Master's thesis.
2. Allow the researcher to take photographs during the workshops, provided that faces are not shown.
3. Permit the use of the student's work (e.g., drawings, written content) in the Master's thesis.

Supervision: The students will be supervised by:

Anjuli Grüschow: _____

Benta Wanga: _____

I understand that participation is voluntary and that I/we can withdraw consent at any time.

Parent/Guardian Consent:

Name of Parent/Guardian: _____ Signature: _____ Date: _____

Student Assent (for students over the age of 18): I understand the purpose of the workshops and agree to participate.

Name of Student: _____ Signature: _____ Date: _____

Contact Information for Researcher: If you have any questions or concerns, please feel free to contact:

Anjuli Grüschow (Master Student)
Email: [anjuli@chalmers.se]

Liane Thuvander (Examiner)
Email: [liane.thuvander@chalmers.se]

Marli Swanepoel (Supervisor)
Email: [marlis@chalmers.se]

- How the data obtained will be used, including whether it is anonymised, and what it will be used for
    - No personal information (e.g., names, faces) will be linked to participants in any published materials. Work and photographs will be stored securely and labeled anonymously.

Approval Signature: Anjuli Grüschow

Name: Anjuli Grüschow

Position/Institution: Chalmers University of Technology

Date:
29 / 01 / 2025

Approval Signature:

_____

Name:

Position/Institution:

Date:
____ / ____ / _____

Approval Signature:

_____

Name:

Position/Institution:

Date:
____ / ____ / _____

Approval Signature:

_____

Name:

Position/Institution:

Date:
____ / ____ / _____

MINISTRY OF EDUCATION
State Department of Basic Education

Telephone.0721439517
Education

E-mail:sscdesiaya2017@gmail.com
(40600)
When Replying please quote
SIAYA

Sub County Director of
Siaya Sub -
County
P.O BOX 199

REF: SYA/SCDE/AWL/P/11/1/37 **DATE: 30TH JANUARY, 2025**

To
The HOI
Awelo Primary and JS

RE: REALITY STUDIO FIELD CLASS JOOUST/CHALMERS UNIVERSITY OF TECHNOLOGY – STUDENT- ANJULI GRU SHOW.

The above referenced student is allowed to begin her master's proramme and will use some of your grade 7 learners. Kindly give her necessary support along with her team led by Dr, Joshua Wanga.

Thank you.

SUB COUNTY DIRECTOR OF EDUCATION
30 JAN 2025
SIAYA
Sign:.....

MAURICE W. SAKA
SUB-COUNTY DIRECTOR OF EDUCATION
SIAYA SUB-COUNTY

Appendix B

Consent Form

Consent Form for Participation in Workshops and Use of Student Work

Participant Information: Name of Student: _____
Grade: _____

Project Title: Master's Thesis Field Study. Preliminary title: Transforming Post-Colonial School Buildings in Africa - Sustainable and Locally-Sourced Construction Approaches Through Community and Student Engagement

Researcher: Anjuli Grüschow, Master's Student at Chalmers University of Technology

---

Purpose of the Workshops: The workshops are part of a Master's thesis project focused on improving school buildings in Kenya, with Awelo Primary School as a case study. The aim is to address challenges like dust and mud by using small, sustainable solutions and local materials. Students and the community will be involved in the process to create practical improvements and help me develop a handbook that can guide other schools.

Your participation will help shape these designs and ensure they meet local needs while fostering a sense of ownership and pride in the results. Students will engage in interactive activities and contribute their ideas and work to the study.

What Participation Involves:

1. Students will take part in supervised workshops, which include [briefly describe activities, e.g., creative tasks, group discussions, or hands-on projects].
2. Photos may be taken during the workshops; however, **faces will not be shown** in any publication or presentation.
3. The students' work created during the workshops (e.g., drawings, written materials) may be included in the Master's thesis.

Confidentiality:

- No personal information (e.g., names, contact details) will be shared in any reports, presentations, or publications.
- All data collected will be used solely for academic purposes.

Rights of Participants:

- Participation is voluntary. Students and parents can withdraw consent at any time without any consequences.
- Students may refuse to participate in any specific activity during the workshops.

Declaration of Consent: I, the undersigned, hereby give consent for my child/the student under my guardianship to:

1. Participate in the workshops organized by Anjuli Lara Deborah Grüeschow as part of her Master's thesis.
2. Allow the researcher to take photographs during the workshops, provided that faces are not shown.
3. Permit the use of the student's work (e.g., drawings, written content) in the Master's thesis.

Supervision: The students will be supervised by:

Anjuli Grüschow: _____

Benta Wanga: _____

I understand that participation is voluntary and that I/we can withdraw consent at any time.

Parent/Guardian Consent:

Name of Parent/Guardian: _____ Signature: _____ Date: _____

Student Assent (for students over the age of 18): I understand the purpose of the workshops and agree to participate.

Name of Student: _____ Signature: _____ Date: _____

Contact Information for Researcher: If you have any questions or concerns, please feel free to contact:

Anjuli Grüschow (Master Student)
Email: [anjuli@chalmers.se]

Liane Thuvander (Examiner)
Email: [liane.thuvander@chalmers.se]

Marli Swanepoel (Supervisor)
Email: [marlis@chalmers.se]

Appendix C

Field Notes, School Information

SCHOOL INFORMATION FOR REALITY STUDIO 2024

COVER PAGE

Name of school:	**AWELO PRIMARY SCHOOL**
NEMIS Code:	**FJPC**
Name of Sub-County:	**SIAYA**
County:	**SIAYA**
Category:	**MIXED DAY**
Email address:	**awelopri020@gmail.com**
Name of BOM Chairman:	**MR. SIMON OMORO**
Cell Phone Number:	**0723006120**
Name of Head Teacher:	**MR. OCHOLA A. TITUS**
TSC Number:	**242795**
Cell Phone Number:	**0723094259**

A. Background Information of the school

1. School Name: Awelo Primary School
2. Sub county: Siaya
3. School code: TSC 14701-41-4315
4. County: Siaya
5. Category: Public mixed.
6. Year of establishment. 1986
7. Status of school registration: Registered; Registration Number: 41S12000948
8. Date of registration. 30/03/2021
9. Current enrollment: 1491

1. Location: Nyandiwa sub-location in township location in Karemo division

2. School motto: Better Your Best

3. Mission: To mould an all-round learner who can benefit the society

4. Vision: To produce learners who are morally upright and enlightend

AWELO PRIMARY SCHOOL ENROLMENT

	GRD 1		GRD 2		GRD 3		GRD 4		GRD 5		GRD6		GRD 7		GRD 8		Total		
AGE	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M & F
Below 5 Years																			
5 Years																			
6 Years	8	10															8	10	18
7 Years	40	53	10	13													50	66	116
8 Years	35	20	43	30	23	21	1	10									102	81	183
9 Years	10	1	28	27	26	42	19	20	3								86	90	176
10 Years			15	18	18	28	43	38	25	20	2	2					103	106	209
11 Years			2	2	5	8	12	9	46	37	12	10	5	6			82	72	154
12 Years					1	2	8	4	24	27	42	48	5	9	3	4	83	94	177
13 Years							2	00	11	8	34	17	41	37	18	23	106	85	191
14 Years									3	2	16	5	32	33	43	40	94	80	174
15 Years											4	00	9	7	28	31	41	38	79
Above 15 Years													3	3	7	1	10	4	14
Total	93	84	98	90	73	101	85	81	112	94	110	82	95	95	99	99	765	726	1491
Total M&F	177		188		174		166		206		192		190		198		1491		

History of the school

Awelo primary school was officially opened in 1986. The head teacher at that time Mr. Francis Otieno Ojow. It began operating from the building occupied by the lower primary classes.

Those building initially were shops that were being by business persons before they relocate to other areas and left the place for the school to begin operating.

The chairpersons who have been in this school are

1. Mr. John Ojwang Sakwa
2. Mr. Joash Onyango
3. Mr. Patrick Ondiek
4. Mr. Simon Omoro

The head teachers have been as follows

1. Mr. Francis Otieno Ojow 1986 – 1991
2. Mr. Ayere 1991 – 1993
3. Mr. Joash Otieno Ogutu 1994 – 1998
4. Mrs. Jane A. Oyule 1999 – 2007
5. Mr. Barrack Were 2008 – 2018
6. Mr. Titus Ochola 2018 –

The school is funded by the Ministry of Education FPE (Free Primary Education), CDF (constituency Development Fund) and the county government of Siaya interms of infrastructure

Location of the Project site

The school is located in Siaya County, Siaya Sub-county Karemo Division,Siaya Municipality, Township ward, Nyandiwa Sub-location, Awelo Zone. It is about 1 Km from Siaya CBD on your way to Awelo market.

The school sits on approximately 10.4 acres of land which is approximately 4.2 hectares, East Alego, Nyandiwa – 1141 GPS Coordinates **0.055426, 34.276846**.

Student enrolment, and teacher Population

The school has a total population of 1491 pupils comprising of 765 boys and 726 girls. 90% of the pupils are luos while the remaining 10% consist pupils from different tribes. The whole of the school population consist of the black race. The school has a total of 41 teachers. 6 from junior secondary of which 2 are male and 4 female teachers. The primary section has a total of 29 teachers. 11 male and 18 female teachers. There are 3 Board of Management teachers 2 male and 1 female.

Socio-economic profile

Majority of students come from humble backgrounds with over 60% consisting of single mothers. Most students live in slum areas of Mahinga, Ombwede, Aringo estate. Their parents are subsistence farmers and others work in restaurants and hotels.

Water supply and usage

The school has two tanks with a capacity of 10000 litres each. There is also pumped bore hole water that supplies the school tank and taps. Apart from that the school is also connected to SIBO Water Company that supplies piped water to school. The school uses 1000 litres daily mostly used by students for drinking, cleaning classrooms and offices. However the sometimes the school face shortage of water. When the borehole pump broke down and SIBO water supply is not consistent the school had a big challenge.

Energy supply and use

When it comes to electricity, the school uses 150 – 200 units of electricity in a month. However the school has no power backup in case of power blackout.

Sanitation infrastructure

The school has a total of 32 doors of latrines with 12 doors for boys and 20 doors for girls. Out of this 1 door each for gender with special needs. There are 3 dustbins in the offices, 2 rubbish pits located near latrines far away from classrooms. The rubbish pit is burnt weekly

Green space and greening initiatives

The school organizes a tree planting day once a term, this has resulted to a total of 2228 trees in the school.

Vulnerability to disasters

The school is exposed to vulnerability of sheet erosion due to its high population. Some areas are consistently used by students hence grass is inadequate leading to loose soil thus erosion takes place. There are droughts between months of December to late March and in the months of August.

The school has existing mitigations measures

1. Tree planting at least once a term.
2. Harvesting rainwater though still inadequate due to lack of funds to buy more tanks and gutters which are durable.
3. There is fire assembly point in case of any emergency.
4. There are natural ventilation in each classroom and offices
5. The school is planning to set up a greenhouse but there is lack of resources
6. Planting grass within the school where there is bare land,
7. Well dug rubbish pits to accommodate rubbish collected within the compound

Our educational goals include:

1. To promote nationalism and patriotism and promote national unity.
   The school is composed of different tribes, religions and pupils from different part of the country. This helps in uniting the whole nation in a common agenda e.g. Climate change programmes like national tree planting day.
2. Promote social economic technological and industrial needs for national development.
   a) Social needs
      Prepare students for changes in attitude and relationship which is necessary for smooth progress developing modern economy in relation to climate change.

   b) Economic needs
      Produce citizens with personal qualities that is required to support growing economy putting into account climate change.

   c) Technology and industrial needs
      Preparing students for changing global trends e.g climate change/ environmental conservation.
3. Promote individual development and self-fulfillment.
   Build individual character in students by developing potential interests and abilities to matters climate change.
4. Promote sound moral and religious value

   Helping students to grow up into self-disciplined self-reliant and integrated citizens in global trends.

5. Promote social equity and responsibility.
   Enhancing students on equity self-responsibility on sustainable use of resource.
6. Promote respect for and development of Kenya's rich and various culture.
   Students should be able to blend the traditional values with changing requirements in line with global trends like climate change.
7. Promote international consciousness and foster positive attitudes towards other nations l

Leading students to accept membership in the international community with all obligations and responsibilities, rights and benefits. This will promote global unity towards global challenges like HIV AIDS, climate change, promote peace.

8. Promote positive attitude towards good health and environmental protection
   Inculcate students the value of good health
   Foster positive attitude towards environmental development and conservation

The school stakeholders e.g. parents, teachers pupils should come together to

1. Promote awareness on matters of climate change
2. Mobilize resources for sustainability and climate change resilience.
3. Plant more trees
4. Promote use of alternative sources of energy e.g solar energy, energy saving jikos,
5. Have proper waste management system within the school that can produce energy
6. Harvesting rain water after acquiring modern storage tanks to curb water shortage in school.
7. Developing natural ventilation in all school set up.
8. Protecting water catchment areas within school and their local environment.
9. Planting grass within school where land is bare.

Emerging issues and thoughts in relation to planning with children

1. Children often have unique perspectives on their surroundings. How can we actively involving them in the design and planning of school space, urban spaces, and create environments that are more inclusive, safe, and responsive to their needs?

2. Child-friendly school space and urban design considers aspects such as play areas, walkability, green spaces, and accessibility to schools. These features enhance the overall resilience of the city. How can we possibly achieve this?

3. How can planning with children enhance climate change education to create increased awareness of environmental challenges and learn about sustainable practices?

4. Through involving them in planning and design, can we create ambassadors for climate-friendly behaviors?

5. Involving children in the creation and maintenance of green spaces within schools and nearby areas to fosters a sense of ownership and connection.

1. Encouraging walking or cycling to school reduces carbon emissions from vehicles. Children's input can help design safe walking routes, pedestrian-friendly crossings, and bike lanes.

2. Schools can serve as community centers during extreme weather events or emergencies. Involving children in disaster preparedness planning ensures that their needs are considered.

3. Community resilience is strengthened when everyone, including children, actively participates in planning and response.

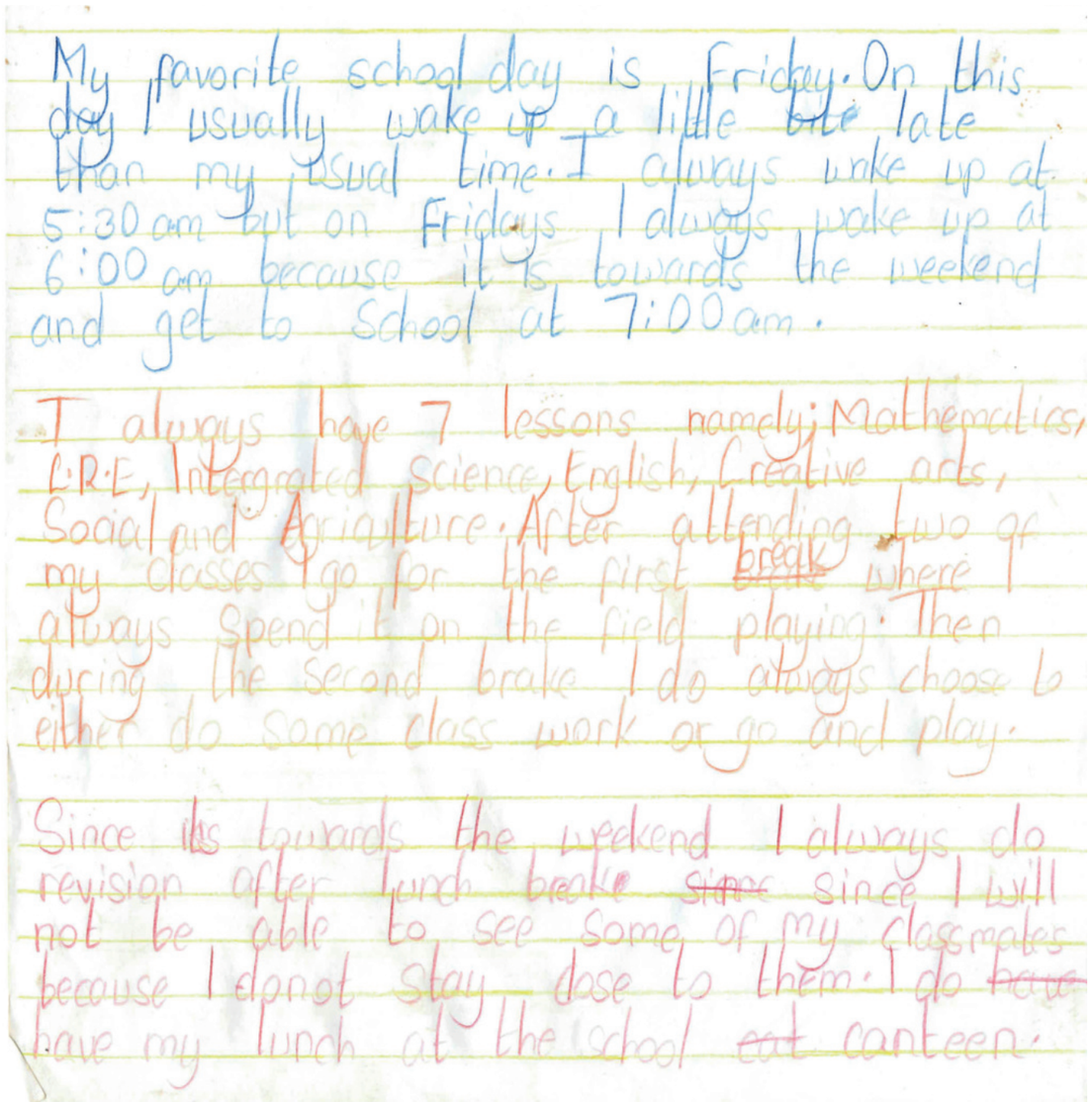
4. Advocacy and Policy Influence: Children's voices matter. When they participate in urban planning, they become advocates for sustainable policies.

5. Their insights can influence decisions related to infrastructure, energy, and waste management.

Appendix D

Voluntary Homework, Storytelling

Choose your favorite school day. Write down the story of that day.
When do you wake up? When do you get to school?
What lessons/classes do you have? What do you do in the breaktime?
What do you do after lunch? Where do you eat lunch?
You can write the story either in English or Kiswahili, as you prefer.



My favorite school day is Friday. On this day I usually wake up a little bit late than my usual time. I always wake up at 5:30 am but on Fridays I always wake up at 6:00 am because it's towards the weekend and get to school at 7:00 am.

I always have 7 lessons namely; Mathematics, C.R.E, Integrated science, English, Creative arts, Social and Agriculture. After attending two of my classes I go for the first ~~break~~ where I always spend it on the field playing. Then during the second brake I do always choose to either do some class work or go and play.

Since its towards the weekend I always do revision after lunch ~~brake~~ ~~since~~ since I will not be able to see some of my classmates because I do not stay close to them. I do ~~have~~ have my lunch at the school ~~eat~~ canteen.

Choose your favorite school day. Write down the story of that day.
When do you wake up? When do you get to school?
What lessons/classes do you have? What do you do in the breaktime?
What do you do after lunch? Where do you eat lunch?
You can write the story either in English or Kiswahili, as you prefer.

My favorite day in school is on Friday.
on Friday's we always go to assembly
and we always play funny games
in the field. That day we have
many free time to do what we want.
I always wake up at 5:30 am and
go to school at 6:20am I always get
to school at 6:30 a.m.
We always have eight lessons ~~/~~ and
we have 30 classes in our school.
~~We~~I always play during breaktimes
After lunch I always relax and
sleep so the the food can ~~be~~
digest in my stomach. We always eat
our ~~fo~~lunch at classrooms or under the
trees.

Choose your favorite School day. Write down the story of that day.
When do you wake up? When do you get to school?
What lessons/classes do you have? What do you do in the breaktime?
What do you do after lunch? Where do you eat lunch?
You can write the story either in English or Kiswahili, as you prefer.

My favorite day is always on Friday because
I and my friends enjoy reading, making stories
and planing for the weekend.
I Always wake up at 5:00am in the morning
I prepare my self and I start my journey
I arrive at School 6:30am morning.
I learn alot of lessons like Maths, English
Kiswahili and many others. During breaktime
we normally play football and after lunch
we rest. I take my lunch in the hall

Choose your favorite school day. Write down the story of that day.
When do you wake up? When do you get to school?
What lessons/classes do you have? What do you do in the breaktime?
What do you do after lunch? Where do you eat lunch?
You can write the story either in English or Kiswahili, as you prefer.

My favaurite school day is on friday and during sports day people alway go to the assembly at 7:20 Am after the assembly we rush back to class and during sports day people from different schools comes to our school, therefore you get a chance to know people from various School and make friendship with them. I Ussualy get to school at 6:30 am in the morning we use to have different lessons, on mondey - Mathematics and in the evening Pre-technical studies. during breaktime I ussually do some of my classwork for that reason I dont have much time to rest. After taking my lunch meal I just take some 30 minutes to cool my brain or rest then do much exercise. I ~~to~~ always take my lunch at the school Cantine and thats how I spend my time during school day

Choose your favorite School day. Write down the story of that day.
When do you wake up? When do you get to School?
What lessons/classes do you have? What do you do in the breaktime?
What do you do after lunch? Where do you eat lunch?
You can write the story either in English or Kiswahili, as you prefer.

My favourite ~~day is Frid~~ school day is Friday. Because it is the day we raise the flag. On Friday I alway woke up early as 5:20 a.m and get to School at 6:50 am and the parade bell is always rang at 7.00 a.am. On Friday we usually have Lessons Like kiswahili, English, S.S.T, C.R.E, visual arts and PHE. During break, I usually go and play Netball because it my favourite game.

And after lunch I usually read storybook or Bible OR I read my notes. And at lunch time I usually run home to take meal. After I have took meal I sweep the house then I come back to school when I am full. Actually this is my favourite school day and I will let it stay bright

Choose your favorite school day. Write down the story of that day.
When do you wake up? When do you get to school?
What lessons/classes do you have? What do you do in the break time?
What do you do after lunch? Where do you eat lunch?
You can write the story either in English or Kiswahili, as you prefer.

My favourite school day is Friday. Other people think that it is as awkward as a cow on ice but on the other side I think that it is as merry as spring.

Oh just when I woke up when the early bird catches the worm, on a friday morning at 4:00 a.m. I prepared my self as fast as a storm and took a cup of tea, prayed for Gods guidance, protection and thanked him for waking up alive and early. I went at school at 6:10 aim, it took me 15 minutes to school. I'm the only person who comes early to school, it is true that early to bed and early to rise, makes a person healthy, wealthy and wise.

On friday's, our classes or lesson are normaly Pre-technical studies, CRE, Maths, English, kiswahili, Bussiness studies, Computer science, Home science, Physical Health Education, Agriculture, Social studies, Performing arts, Visual arts, Live skills, Health Education and Interborated science.

On friday mornings we normaly have Creative arts and sports and Pre-technical. After our first breaks we have english and kiswahili. After second break we have Maths and Agriculture. After lunch we have Social studies and Intergrated science. After games time we normaly have free lessons which we use for reading or revising for exams or some people sleep or rest to relax their minds. I wish that we would have a computer lab or computer to use during computer science.

At breaktime, we normaly book for a place to sit while odering snacks and refreshers like french fries, milkshakes, juice, soda, donats with sprinkle on top, cup cakes, mini cakes, cookies with fancy decorations and crackers. Some people prefer going to the field for physical activities.

After lunch we normaly go to class and study or sometimes we are taught by teachers or we sometimes we read our books.

At lunch we normaly eat "chapati", With beans or "chapati" with greengrams, Rice with beans, rice with green grams or chicken or meat or fish or even boiled potatoes, pilau, noodles, spaghetti or "ugali" with meat. Other people stay hungry, I hate seeing people starve or stay hungry at lunch time, I wish that if there would be a person who can help

them and provide for them food and other resources.

I normaly like it when we go home, because we normaly buy snacks for the road. Some times we or we normaly walk by foot. I wish we had a school bus.

Reasons of why I like it on fridays

→Because on friday nights we get to plan on what we are going to buy at a supermaket.

→Because on friday's it is normaly on my birthday party.

→We get to relax our brains.

→We get to revise our books.

→It is a nice day of planning where you are going to relax.

Choose your favorite school day. Write down the story of that day.
When do you wake up? When do you get to school?
What lessons/classes do you have? What do you do in the breaktime?
What do you do after lunch? Where do you eat lunch?
You can write the story either in English or Kiswahili, as you prefer.

On Tuesday is my favourite day. I wake up at 6:00 am, I prepare for around 30 min and go to school at 6:30 am. In ~~the first~~ break We have 3 lessons of tuesday, and the rest are for drama and games.

On break time I play with my friends and take tea. After lunch we go for debate that is the most exciting part. We eat lunch at the school cantinue.

Choose your favorite school day. Write down the story of that day.
When do you wake up? When do you get to school?
What lessons/classes do you have? What do you do in the breaktime?
What do you do after lunch? Where do you eat lunch?
You can write the story either in English or Kiswahili, as you prefer.

My favorite day in school is on Tuesday I love Tuesday because on tuesday we always have Five lessons That day we dont go for Remedial During Remedial lessons we are always allowed to go for games

I wake up at 4:30am. at I get to school at 6 We always have our lunch at the School Canteen On tuesday we Career and talent guiding

I am always happy on that day because that day we are always allowed to have conversation with everyone you know. Me I like having friends and my friends include

Asante.

Choose your favorite school day. Write down the story of that day.
When do you wake up? When do you get to school?
What lessons/classes do you have? What do you do in the breaktime?
What do you do after lunch? Where do you eat lunch?
You can write the story either in English or Kiswahili, as you prefer.

My favourite school day is always on Tuesday. I like Tuesday because I dont mop the class that day. I always mop on Monday. I wake up at 4:00 or 4:30 to prepare myself to go to school. I always get to school before the sun rise. because I live far from the school I always wake up early in the morning so that I can reach to school early. Lessons that we are taught in school include mathematics, English and also Kiswahili. In our school we have so many classes. At breaktime I always play with my friends. After Lunch I always read my books and notes. At Lunch I always eat Chicken, brocoli and Ugali which makes me healthy. Chicken is useful because it provides protein in my body. Brocoli helps in Vitamin and Ugali carbohydrates. That is all I do on Tuesday.

Choose your favorite School day. Write down the story of that day.
When do you wake up? When do you get to school?
What lessons/classes do you have? What do you do in the breaktime?
What do you do after lunch? Where do you eat lunch?
You can write the story either in English or Kiswahili, as you prefer.

My favorite day in school is sports day.
Sports day in school is my favorite because I get to have alot of fun, I also enjoy because I get to watch players participating in their various areas of talent and I also get to participate as I am also a Soccer player.
When do I wake up? I wake up at 4:20 to prepare for school.
When do I get to school? I get to school at 6:20.
What lessons/classes do you have? English, C.R.E, home science, intergrated science, mathematics, Social studies, Sports, Performing art, visual art, pretechnical, Kiswahili, Agriculture and nutrution.
What do I do in the breaktime? I play with my friends, eat whatever I have and take my books for marking.

What do you do after lunch? I go back to class for afternoon lessons.
Where do I eat lunch? I eat my lunch at the canteen.

Choose your favorite School day. Write down the story of that day.
When do you wake up? When do you get to school?
What lessons/classes do you have? What do you do in the breaktime?
What do you do after lunch? Where do you eat lunch?
you can write the story either in English or Kiswahili, as you prefer.

My favorite school day is sport day.
Sport day is my favorite day because that day we play in the field and exercise our body to be strong and fit.
When do I wake up? I wake up at 4:20 to prepare for school.
When do I get to school? I get to school at 5:20
What lessons/classes do I have? English, Mathematics, Agriculture and nutrition, Social Stuches, pretechnical, visual arts, performing arts, C.R.E, homescience, Intergrated science, creative arts and sports, Kiswahili
What do you do at breaktime? I play with my friends, eat our food and take our books for marking. What do you do after lunch? I eat my mango fruit that I carried. Where do I eat lunch? I eat my lunch in class.

Choose your favorite School day. Write down the story of that day.
When do you wake up? When do you get to school?
What lessons/classes do you have? What do you do in the breaktime?
What do you do after lunch? Where do you eat lunch?
you can write the story either in English or Kiswahili, as you prefer.

On Thursday is my favorite day because it is always sports day. Sports day is when we play many types of games. In every two terms, once in a year, we have two types of events in sports. In term one we have athletics events and in term two we have ball games.

I wake up at 4:00am. I get to school at 6:00am. The lessons starts at 8:00am I walk around the school with my friends at break time.

I draw and colour pictures with colour blue. I eat lunch in class. After eating my lunch I just sit and Read my favorite Storybook about The war against Taka-Taka.

Appendix E

Walking and Talking with Benta

How do the new buildings look like in comparison to the old ones? - What changed?
- The classrooms are bigger, adjusted to the size of the classes with around 70 students.
- There are ramps leading to the entrances of each classroom, making them accessible.
- The windows are higher, so learners don‘t smash them as easily anymore.
- The entrances are recessed to make them less obvious and protect the classrooms from break-ins.

How did the school apply for funding for the new buildings?
- Benta wasn‘t quite sure about this, but she told me that after applying for funding, there were employees from the Ministry of Education checking what amount of classrooms the school was missing and approving two new buildings.

How much money can the school spend each year, and what is it used for?
- I wouldn‘t really get an answer on this. But Benta told me that the school is supposed to get enough book supplies for all children for each term, but they don‘t receive enough.

Why is the motto of the school “Better your Best,” and does it have a deeper meaning? Do you know who chose it?
- The motto was chosen by the headmaster and the teachers to encourage the learners to always do their best and push themselves to become better every day.

What languages are taught and used here at school?
- Even though the the mother tongue is Dahluo, at school the learners are asked to speak English and Kiswahili, the official and national languages of Kenya. A lot of the younger students have difficulties with the English language; that‘s why teachers often use Kiswahili also in classes that are supposed to be taught in English.

If the school had more classrooms available, would there be enough teachers?
- No. There is a general shortage of teachers, so it wouldn‘t really work with more classrooms because there would not be enough teachers for teaching.

The last time when we met the school community for the first time, we prayed together, and if I remember correctly, you also told us that it is part of the meetings in the assembly and part of the curriculum. Are all students going to Awelo Christians?
- Yes, you‘re absolutely right. We pray together on Mondays and Fridays in the assembly. I haven‘t heard from any learner that was not Christian. I believe they all are, but maybe from different confessions.
-

Do you know for what kind of built things I would need a permission and from whom?
- The Ministry of Education as well as the Ministry of Lands and Physical Planning would need to permit a building. But that takes a lot of time, so the common way is to build and then inform.
- Depending on what you are planning to do, we should talk to the headmaster of the school about it and see what solutions we can find. As long as things are movable, you are safe to do them.