



TWO RABBITS

Dengbe Bide
Midline Impact Evaluation Report
July 2019

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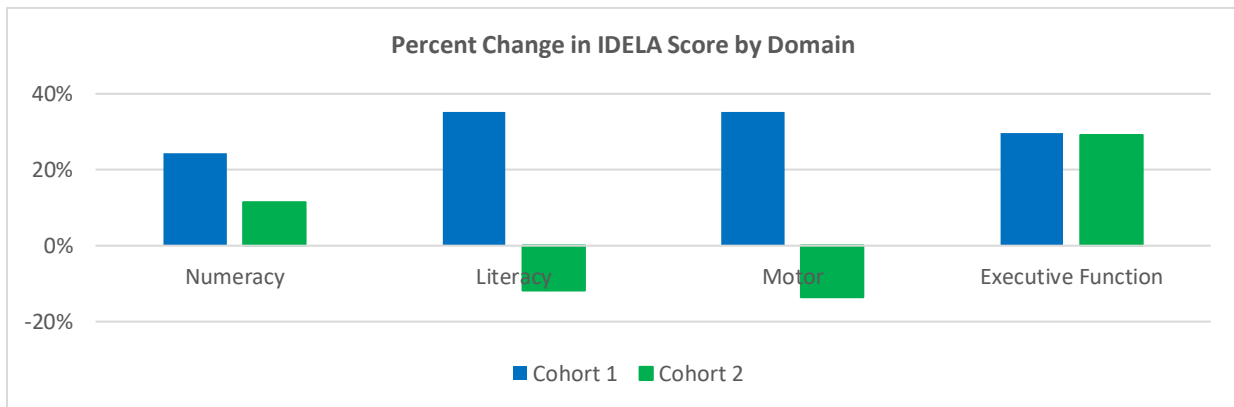
Acronyms:

ASTRADHE:	Association pour la Traduction et le Développement Holistique de l'Être Humain
COGES:	Comité de Gestion d'École (Parent-teacher association)
CPC :	Community Preschool Center
ECCE:	Early Childhood Care and Education
IDELA:	International Development and Early Learning Assessment
MINEDUB:	Ministère d'Éducation de Base (Ministry of Basic Education)
SEL:	Socioemotional Learning

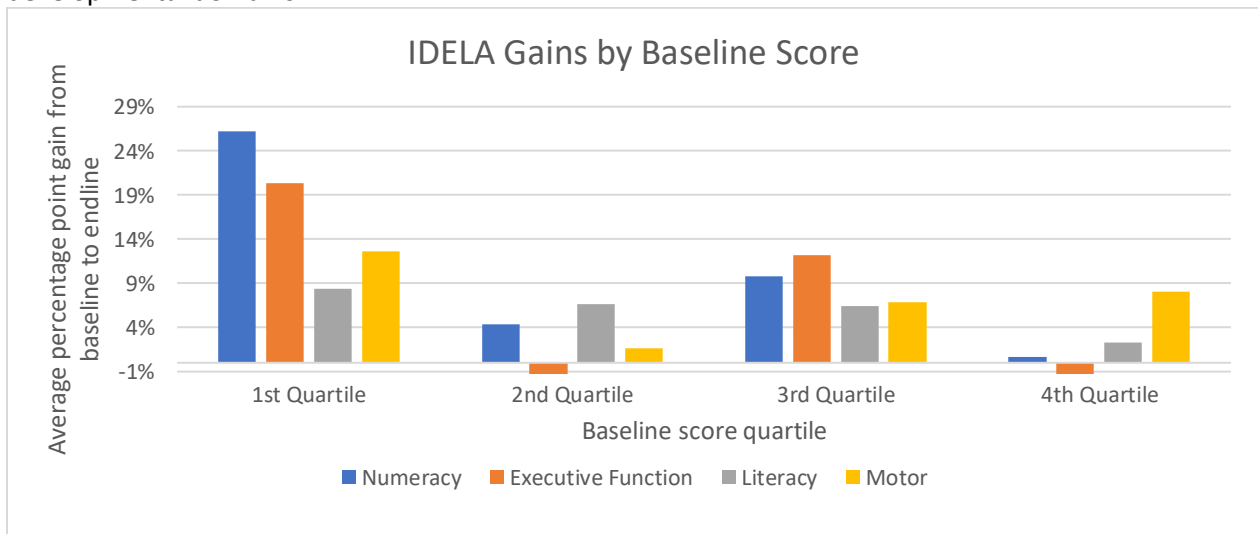
Executive Summary

Cultural relevance is a key element of quality in early learning programs, and support positive child development outcomes. The present report explores the impact of an early childhood care and education program called Dengbe Bide that is designed by and for indigenous communities in Cameroon. This impact evaluation was conducted comparing results of students that received one year of Dengbe Bide intervention (“cohort 1”) and students that did not (“cohort 2”). Child development outcomes were measured using a locally adapted version of the internationally validated International Development and Early Learning Assessment (IDELA).

Overall, cohort 1 children experienced larger gains across numeracy, literacy, motor, and executive function domains as compared to cohort 2.



When examining the causal relationship between the curriculum and performance, results show that one year of participation in the program has a statistically significant positive relationship on literacy, motor, and total child development scores. The program is most impactful for children with the greatest need. Participating children with the lowest scores at baseline experienced the most growth across all developmental domains.



In general, impact of the curriculum on the four measured child development domains differed by sex, with female students tending to have lower scores at baseline and endline, indicating systemic gender disparities that exist in target communities. We find that increases in children’s approaches to

learning—how a child approaches a new or challenging task and their attitude during learning activities— correspond with increased scores in all four child development domains, indicating that participating children make gains in content knowledge and learning strategies. Finally, we observe that while teachers delivered the program with high levels of quality and fidelity, there was not a consistent statistical relationship between quality of instruction and child learning outcomes.

Introduction

Context

The Baka are an ethnic group located in the East and South Regions of Cameroon. The Baka are historically a semi-nomadic forager society. Their primary livelihood activities include hunting, fishing, and collecting edible and medicinal plants and honey. Over the past 50 years, government, religious, and civil society organizations have worked to transition the Baka from semi-nomadic hunting and gathering to sedentary agriculture and animal husbandry. There has been a simultaneous increase in activities that significantly limit Baka access to forest resources, including logging, poaching, mining, and creation of wildlife conservation zones. This uprooting has coincided with increases in alcoholism, depression, and malnutrition in Baka villages. For example, it is very common for Baka adults to perform day labor on the farms of the “Bantu” majority ethnic group, who are predominantly farmers, in exchange for alcohol, small sums of money, or food.

Prevalent stigma against the Baka leads many children to feel ashamed of their culture. School is in French, which is spoken in few Baka households. Daily presence in the classroom requires children to abandon their families’ foraging activities. Baka children drop out of school at higher rates than Bantu, and 80% of Baka adults identify as illiterate. Under the International Declaration of the Rights of Indigenous Peoples, communities like the Baka have a right to pursue both their traditional ancestral education, as well as state-provided formal schooling. A Baka father described this as like “chasing two rabbits at once:” if you try, you will lose them both.

Program overview

Dengbe Bide in Baka means “two rabbits.” The mission of Dengbe Bide is to support Baka communities to chase both “rabbits:”to pursue their traditional forest-based education, while preparing children for success in primary school and beyond. The Dengbe Bide program mobilizes Baka communities to create community preschool centers (CPC) that honor their culture. Dengbe Bide is implemented by the local nonprofit association ASTRADHE and US-based nonprofit Two Rabbits. There are three components to the program. First, Dengbe Bide engages community members including musicians, storytellers, and leaders to develop preschool curriculum of stories, songs, and games in the Baka language that reflect the forest context. The team records this content in mp3 form, and loads it onto solar- and crank-powered mp3 players. Second, Dengbe Bide trains community-nominated youth to serve as teachers. Recordings provide in-the-moment guidance that is accessible to teachers with low literacy levels on how to deliver quality enrichment. Third, Dengbe Bide supports parent-teacher associations to own and manage the centers.

Target results

Dengbe Bide seeks to prepare Baka children for success in school and in life while empowering community members as central agents of change. The program’s target impact for children, teachers, and communities are summarized below.

Child-level results	Teacher-level results	Community-level results
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<ul style="list-style-type: none"> • Improved child development in numeracy, motor skills, literacy, language, and executive function. • Improved overall child development scores. • Gender parity in overall and domain-specific child development scores. • Improved parental perception of children’s cultural pride • Improved primary school teacher perception of children’s readiness for school 	<ul style="list-style-type: none"> • Number of teachers with improved fidelity of implementation of lessons from the beginning to the end of the year. • Percentage of teachers with at least 70% fidelity of lesson implementation • Improved community perception of teacher effectiveness 	<ul style="list-style-type: none"> • Percentage of villages with a trained school management committee (COGES) • Parent perceptions of satisfaction with the program • Community perceptions of ownership and appreciation of the program.
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Research questions

Dengbe Bide is conducting an impact evaluation over two years that seeks to address the following questions:

1. What effect does the Dengbe Bide model have on children’s cognitive development, motor development, cultural pride, and readiness for success in school and the community?
2. Is a second year of Dengbe Bide curriculum associated with improvements in cognitive development, motor development, and cultural pride among children, beyond improvements associated with a single year of curriculum?
3. How does program impact differ based on the sex of the child, the household characteristics of the child, and the teacher’s instructional practices?

Methodology

The Dengbe Bide impact evaluation uses phased program implementation to two cohorts from 2018-2020, with a differences-in-differences identification strategy. Dengbe Bide used a cluster-based phased implementation approach. This involved assigning 10 villages each to cohort 1 and cohort 2, and progressively rolling out the program over a two-year period. In year 1 (school year 2018-2019), Dengbe Bide delivered preschool level one curriculum (P1) in ten cohort 1 villages, with the ten cohort 2 villages serving as controls. In year two, Dengbe Bide offered P1 and P2 in cohort 1 villages, and P1 in cohort 2 villages.

	2018-2019 school year	2019-2020 school year
Cohort 1	P1	P1 and P2
Cohort 2	No intervention	P1

This report provides insights into research question 1, and presents the quantitative findings from the midline evaluation after one year of implementation, comparing outcomes of children who received P1 of the Dengbe Bide program (cohort 1) to children who received no intervention (cohort 2).

Village selection. The Dengbe Bide Monitoring, Evaluation, and Logistics Officer collaborated with district inspectors of the Ministry of Basic Education (MINEDUB) to identify 20 villages eligible for the program in July 2018. Eligibility criteria included being within one day’s motorcycle ride from the project

office, having at least 15 children of preschool age, and the absence of an official government preschool within the village.

Data collection tools: Dɛngbɛ Bide conducts baseline and endline assessments at the beginning and end of each school year, continuous data collection on process and output indicators, and ongoing monitoring of program quality and fidelity of implementation. This approach enables collection of data on impact, quality of implementation, and intermediary factors that could explain or moderate the relationship between the intervention and program impact.

International Development and Early Learning Assessment (IDELA). Dɛngbɛ Bide used IDELA to measure children’s early learning and developmental status through a series of games and activities that permit direct observation. The results of IDELA serve as the primary measure of impact on children’s cognitive (numeracy, literacy, executive function), language, and motor skills. Dɛngbɛ Bide translated the internationally validated French version of the IDELA tool developed by Save the Children into Baka, the local language of instruction. Upon reviewing the socioemotional test items of the IDELA tool, the Dɛngbɛ Bide team did not feel they adequately reflected the Baka cultural context, and therefore omitted them from the tool. Dɛngbɛ Bide translated and field tested the updated version with 50 observations, and found that it had adequate consistency, validity, and reliability. The validation report is available upon request. Dɛngbɛ Bide used a census approach for sampling children in all villages, except in villages that had more than 30 students. In these villages, assessors randomly selected 30 children from the school’s enrollment register to evaluate. The table below summarizes retained IDELA items in the validated tool:

Motor Development	Emergent Literacy	Emergent Numeracy	Executive Function
Hopping	Print awareness	Comparison by size and length	Inhibitory control
Copying a shape	Oral vocabulary	Sorting and classification	Short-term memory
Drawing a person	Letter identification	Number identification	
Folding paper	Emergent writing	Shape identification	
	First letter sounds	1:1 correspondence	
	Oral comprehension	Addition and subtraction	

IDELA also includes questions about approaches to learning. Approaches to learning relate to how a child approaches a new or challenging task, and their attitudes during learning activities. The IDELA assessment contains two clusters of items on children’s approaches to learning. One cluster relates to the child’s overall approach to learning. This is a series of questions at the end of the assessment that asks the enumerator to rate the child on seven aspects of their approach to learning during the assessment. The other cluster measures the child’s approach to learning for specific tasks. This cluster is a two-question series placed at the end of each of several particularly challenging IDELA items. Children are rated with a score of 3 if they always display the given approach to learning, 2 if they display it often, 1 if sometimes and 0 if never. A summary of the questions in each cluster is below.

Overall approaches to learning	Item-specific approaches to learning
<ul style="list-style-type: none"> Did the child pay attention to the instructions and demonstrations throughout the assessment? 	<ul style="list-style-type: none"> Child stays concentrated on the task at hand; not easily distracted

<ul style="list-style-type: none"> • Did child show confidence when completing activities; did not show hesitation? • Did the child stay concentrated and on task during the activities and was not easily distracted? • Was child careful and diligent on tasks? Was child interested in accuracy? • Did child show pleasure in accomplishing specific tasks? • Was child motivated to complete tasks? Did not give up quickly or want to stop the task? • Was the child interested and curious about the tasks throughout the assessment? 	<ul style="list-style-type: none"> • Child is motivated to complete task; does not want to stop the task.
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IDELA Home Environment Questionnaire (IDELA-HE). IDELA-HE is a companion tool to the IDELA child assessment that assesses aspects of the child’s caregivers and home environment that could explain variance in IDELA scores. This includes family demographics, prior participation in early childhood development programs, home learning resources, caregiver activities and interactions, socioeconomic indicators, and parent attitudes, perceptions, and practices. Dɛngbɛ Bide translated the internationally validated French version of the IDELA-HE tool developed by Save the Children into Baka, and tested the items through pilot interviews with caregivers. The table below summarizes the items in the IDELA-HE tool.

Section	Description
General family information	Sex and age of child, number of caregivers and children at home, parental literacy and education, home languages
Early childhood development experience, and education expectation	Child participation in early childhood development programs, parental expectations and hopes for child’s educational attainment
Learning materials and resources at home	Types of reading materials and toys at home
Parenting practices, support for learning and development.	Caregiver activities that promote learning and development, caregiver disciplinary practices, perceptions of parental role in child development.
Participation in preschool service provision	Caregiver engagement in activities in support of preschool
Socioeconomic indicators	Family ownership of common assets
Disability	Child’s disability status and type.

Teacher questionnaire: The teacher questionnaire was developed by Dɛngbɛ Bide to assess perceptions among kindergarten teachers in government primary schools of Baka children’s readiness for school. It is administered as a paper survey that the teacher fills out independently, or that the enumerator fills out by asking the teacher each question and noting his or her response. The tool captures both qualitative and quantitative responses, as summarized below.

Qualitative Questions	Quantitative Questions
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What strengths do Baka learners have upon school entry? Where do these strengths come from?	Yes or no: Do the majority of Baka kids have the following skills upon school entry? Do Bantu kids? <ul style="list-style-type: none"> • Letter names and sounds • Phonemic awareness • French language • Positive attitude towards learning, • Attention span and memory • Self-confidence • Number sense
Are Baka children ready to learn when they get to SIL? If not, why?	
What are the difficulties that Baka children face in learning in school, and what is the reason for these difficulties?	

Caregiver focus group: Dengbe Bide developed a focus group discussion guide to gather caregivers' perceptions of Baka traditions, how their children perceive Baka traditions, their children's readiness for school, and the Dengbe Bide program. The purpose of this tool is to shed light on the project's impact on cultural pride among children and communities, and to get feedback from communities about their satisfaction with the program. The tool gathers qualitative data, as summarized below.

Section	Description
Children's perceptions of Baka culture	What is the importance of Baka culture in the education of Baka children? Why?
Traditional ways of learning in Baka culture	What do your children know how to do well? How did they learn this? What can we learn from Baka traditions?
Baka children's school readiness	Do Baka children learn easily when they get to school? Why?
Dengbe Bide program performance	How do you feel the animators teach the children? What suggestions would you have for them to teach better? How does the Dengbe Bide project serve your children? What is your vision for the project in the future? Play a lesson sample for parents and ask: do you believe that this lesson is relevant to your life? Why?

Teacher Observations. Dengbe Bide developed a teacher lesson observation tool to assess teacher fidelity of program implementation and quality of the classroom environment. The tool captures teacher adherence to the Dengbe Bide curriculum and pedagogical approaches. It also gathers information on structural quality and process quality in the classroom. The content of the tool is summarized below.

Section	Description
Class size	<ul style="list-style-type: none"> • How many boys and girls are in class?
Fidelity to the curriculum	<ul style="list-style-type: none"> • What lesson is planned per the curriculum for today? • What lesson is the teacher teaching? • Is the teacher using the mp3 player? • Is the teacher using the teacher guide? • What percentage of the lesson steps did the teacher follow?

Process quality	<ul style="list-style-type: none"> • Who is using the following materials (Teachers, some students, all students, or no one)?: Letter and number cards; math counters; play kits; read aloud books, student notebooks, writing workbooks
Structural quality	<ul style="list-style-type: none"> • Did the teacher ensure that the majority of children participated in lesson activities? • Were children talking at least half the time? • Did teachers correct children’s errors in an encouraging and positive way? • Did children work in pairs or groups? • Did teachers punish kids in a hard or physical way? • Did the teachers observe and guide the students during activities?

Data analysis. Data analysis serves to identify program impact on target outcomes, understand differential impact among sub-groups, and explore the relationship between quality of program implementation and impact on target outcomes.

Data quality assurance. All data underwent cleaning and analysis of quality, validity, and reliability. Strategies include double-coding of a sample of IDELA observations for inter-rater reliability, checking results for missing or implausible data, reviewing distributions to check for heaping or skewed data, as well as ceiling and floor effects, and verifying correlation among scores in similar areas for consistency. Dengbe Bide also tracked frequency of collection of classroom observation data, through online dashboards that consolidate and visualize field data collection activities in real time.

Baseline analysis. Dengbe Bide gathered and examined baseline data on the composition of the study group to identify any observed differences between cohorts 1 and 2. This included comparing descriptive statistics and analyzing cohort assignment correlations for each outcome indicator and explanatory factors. The purpose of this exercise is to ensure that cohorts are comparable at baseline in terms of developmental outcomes, and explanatory factors such in the IDELA-HE items. The results of this analysis found no significant differences between treatment and control groups. Full baseline data analysis is available upon request.

To analyze qualitative data at baseline, Dengbe Bide conducted open coding of baseline focus group responses from parents and questionnaire free responses from teachers. Dengbe Bide analysts combined the resulting emic nodes with nodes for etic constructs embedded in the program design and research question, such as cultural pride, discrimination, and readiness for school. The resulting nodes were compiled into a codebook for qualitative coding of baseline and endline data. The complete codebook is available upon request.

Impact data analysis. We analyze endline data at the end of each school year, using baseline data and monitoring data as explanatory factors. Endline analysis after year one seeks to answer the following questions:

- Is one year of the Dɛngbɛ Bide program associated with improved school readiness and cultural pride?
- Is the observed effect particularly strong for certain subgroups within our sample?
- What intermediary factors help to explain this effect?

Quantitative analysis to answer these questions begins with a presentation of descriptive statistics for each outcome and predictor indicators (IDELA and IDELA-HE), as well as variables for implementation quality (fidelity of implementation and classroom environment quality), with all data disaggregated by sex. The report then presents linear regression models that progressively add predictor variables to generate models that explain variance in endline scores. This analysis not only considers comparisons of averages among cohorts, but also progress in results from baseline to endline. Finally, the models use interaction terms to understand program impact among subgroups, including by village, sex, and IDELA score at baseline.

Regarding qualitative data from caregiver focus groups and primary teacher questionnaires, we analyze the prevalence of codes (from the codebook developed at baseline) by respondents in each cohort. We then explore qualitative categories, as well as linkages between categories, comparing baseline and endline findings. This analysis shows trends in caregiver perceptions of children’s school readiness and cultural pride from baseline to endline in each cohort, as well as cohort 1 caregiver views of the program as a whole.

Assessor training and practice. Dɛngbɛ Bide staff served as enumerators for all data collection activities. Enumerators received four days of training on the IDELA and IDELA-HE tools before conducting baseline data collection in October and November 2018. This included field exercises to practice evaluating children, and inter-rater reliability exercises to norm on interpretations of questions and assessment of child responses. The qualitative tools had been used in previous data collection exercises by the Dɛngbɛ Bide team. To refresh enumerators’ memories of the questions and assessment procedures, the team read through the qualitative questionnaires before conducting baseline data collection. Before collecting endline data, the team held a two-day refresher training to review data collection tools once more.

Sample. The tables below show the number of individuals sampled at baseline and endline.

	Children	TR Teachers	Households	Primary school teachers
Baseline				
Cohort 1	147	20	74	10
Cohort 2	146	N/A	43	10
Endline				
Cohort 1	116	20	84	10
Cohort 2	82	N/A	77	10

Limitations. Limitations to the present study include small sample size, use of internal enumerators, lack of random assignments, attrition, and imperfect data on child age.

Sample size. Given financial and logistical capacity at the time of the study, it was only possible to include 20 villages in the sample. The small sample size means the study has limited statistical power. For this reason, relationships between variables may not register as statistically significant, given the increased likelihood of type two error.

Internal enumerators. Since Dɛngbɛ Bide staff supported program implementation and also served as enumerators, there is a risk that data may be biased. Dɛngbɛ Bide sought to mitigate this risk through regular data quality checks, inter-rater reliability exercises, and mixed data collection teams that include members of the Baka community.

Lack of random assignment. The original study design involved random assignment of these 20 villages to cohorts. However, shortly before the start of the school year, the district-level MINEDUB representative requested that Two Rabbit change village selection. At the same time, two villages became inaccessible due to road conditions from heavy rains, and another became ineligible because of health concerns among the literate individuals that would have been eligible to become teachers. For these reasons, Dɛngbɛ Bide replaced three of the originally selected ten cohort one villages, and four of the original selected ten cohort two villages. The study mitigates the impact of this change by using a differences-in-differences identification strategy in lieu of a randomized controlled trial.

Attrition. Given the semi-nomadic lifestyle of the target population, there was significant fluctuation in children's participation throughout the school year. Absentee rates increased during the fishing season in early 2019, and decreased afterwards towards the end of the school year. Some children evaluated at baseline were not available to be evaluated at endline. Analysis of these children's baseline data reveals no significant difference between children who dropped out and who remained in the study. This data is available upon request.

Child age data. As nearly all Baka children are born in the home, almost no children in our sample have birth certificates. Data on child age is based on caregiver estimate, and is therefore imperfect. Caregivers estimated only their child's age in years, and not in months. To assess the reliability of age data, Dɛngbɛ Bide correlated age with baseline IDELA scores. This revealed a consistently positive and significant relationship between age and IDELA score across domains, indicating that caregiver age data is at least somewhat reliable.

Results

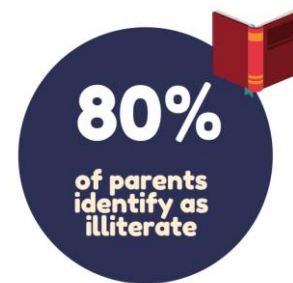
Family and caregiver characteristics

Key take-aways:

- **Perceptions of child academic potential.** Caregivers are confident in their children's ability to succeed in school, despite their own low school attainment levels.
- **Caregiver education levels.** Almost all caregivers have a primary education level or less, and identify as illiterate.
- **Household learning materials.** Almost all households lack reading and writing materials, but caregivers and children make their own toys out of objects from the home and the forest.
- **Balance of care.** Children spend as much time in the care of older siblings as they do in the care of their mother or father.

Parental Education

Eighty percent of parents identify as illiterate. This includes 8% of mothers and 27% of fathers, with literacy rates slightly higher for both mothers and fathers in cohort 2 than cohort 1. Only 3% of mothers completed some secondary school, while the majority list primary school as the highest level of education started or completed. Among fathers, 19% reported completing some secondary school, and about two thirds list primary school as the highest level of education started or completed. These rates are similar across cohorts. The majority of parents have high expectations for their children's education, with 97.5% believing that their child will finish primary school and 98% believing their children will finish secondary school.



Socioeconomic status (SES)

Dengbe Bide assigned households an SES score from 0-5 by measuring household wealth and parental literacy. Households got one point each for possession of a radio, phone, artificial or electric light, farmland, and farm animals. Households got another point for having at least one parent who identifies as literate. The average SES measure across households was 1.26.

Household environment



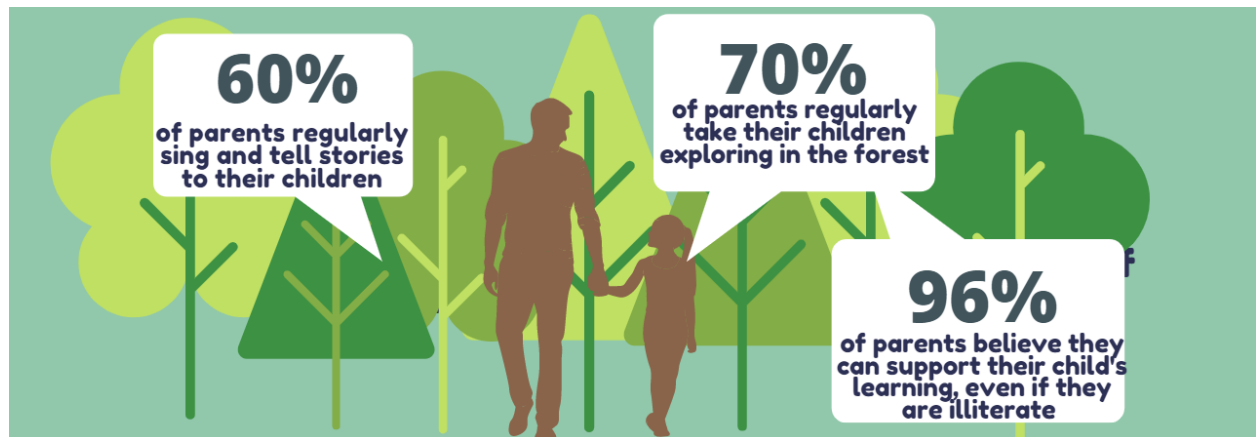
We observe a drastic absence of reading and writing materials in households. Approximately 98% of lack child-appropriate stories or picture books, 97% lack textbooks, 97% lack newspapers, and 95% lack religious books. Just 9% of households have any writing or drawing materials. However, we observe great ingenuity in creating toys. While just 29% of households have store-bought toys, 72% make homemade toys, while 51% and 91% use household objects and natural objects (like leaves and stones) as toys, respectively.

Parenting practices

The IDELA household measures parenting practices by taking an inventory of the learning activities and behavior management strategies that they have used in the past week. Learning activities include reading or looking at books, telling stories, singing songs, exploring the forest, playing with toys, drawing, doing subsistence activities (like hunting, fishing, or gathering), learning the alphabet, and

counting or learning numbers. Behavior management strategies include hugging or showing affection, hitting, or scolding the child.

We find that 26% of mothers and 21% of fathers performed three or more learning activities with their child in the past 7 days. This differed notably between cohorts, with three times as many fathers in cohort 1 reported doing regular learning activities with their child compared to fathers in cohort 2. The most common learning activities reported by both mothers and fathers include telling stories, singing songs, exploring the forest, and doing subsistence activities.



While most parents report showing affection to their children, most also reported hitting and scolding their children. The tool also assesses the time that children spend in the care of different caregivers. On average, mothers spend 3.5 hours per day interacting with their children, while fathers spend 2 hours per day. Children spend an average of 3.3 hours per day in the care of older siblings, and are typically alone for about 0.4 hours per day.

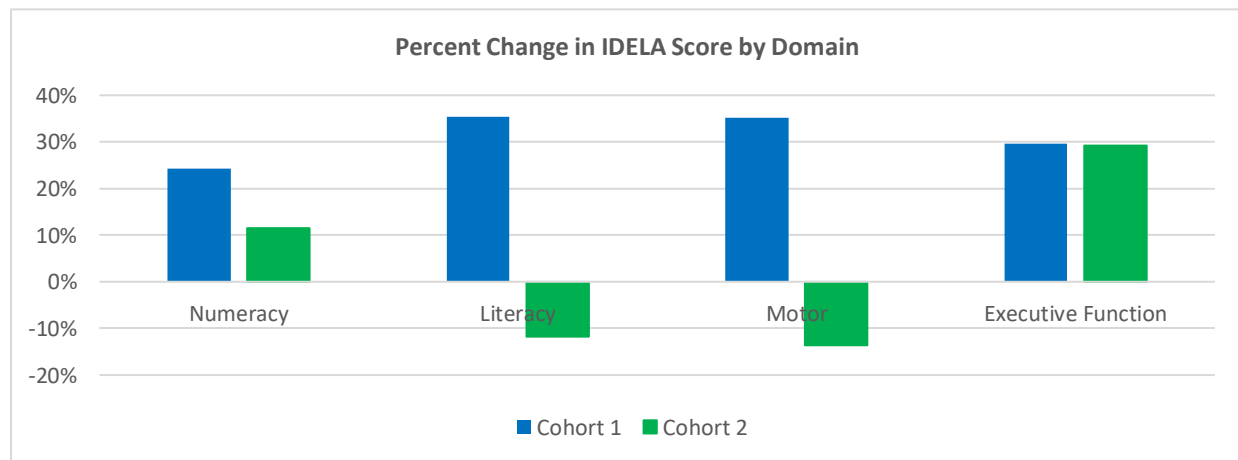
Program Impact

Child Development Outcomes

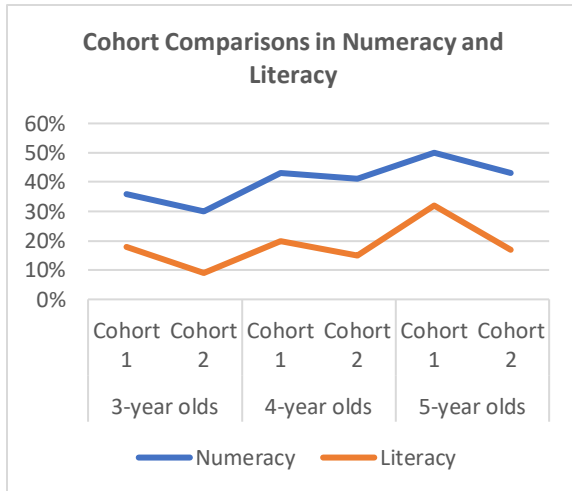
Key take-aways

- **Overall impact.** Dɛngbɛ Bide participants outperform control group children across all measured domains.
- **Age matters.** Four-year-old Dɛngbɛ Bide participants achieved higher overall scores than five-year-old control group children.
- **Literacy and motor boosts.** Dɛngbɛ Bide benefits are particularly pronounced for literacy and motor skills, with participating children achieving 33% and 32% higher gains, respectively, compared with controls.
- **Efficacy matters.** Children with more positive attitudes and greater self-efficacy perform better on IDELA tasks regardless of cohort placement. This demonstrates the critical importance of building children’s confidence, resilience, and problem-solving skills through early childhood programming
- **Gender gaps persist.** Girls and boys benefit equally from the Dɛngbɛ Bide program, but there are persistent gender gaps in scores at baseline and endline and across cohorts, indicating systemic disparities in child development in target communities.

Participants in Dɛngbɛ Bide experienced greater gains in IDELA scores across domains as compared to children who did not receive the intervention. Cohort 1 children had an average increase of 39.6 percentage points across the four IDELA domains of numeracy, literacy, motor, and executive skills, as compared to just 1.9 percentage points for cohort 2. A comparison of cohort 1 and 2 children’s scores by domain is below, and all regression outputs are found in Annex A.



Age. Children from cohort 1 outperformed those from cohort 2 of their same age across all domains, with the exception of executive function for which four-year-olds from cohort 2 outperformed four-year-olds from cohort 1. Comparing same-aged students across cohorts, results show that younger age groups from cohort 1 performed at the same level or better than older age groups in cohort 2. For example, four-year-olds in cohort 1 had an average score of 43% on numeracy, which is the same score

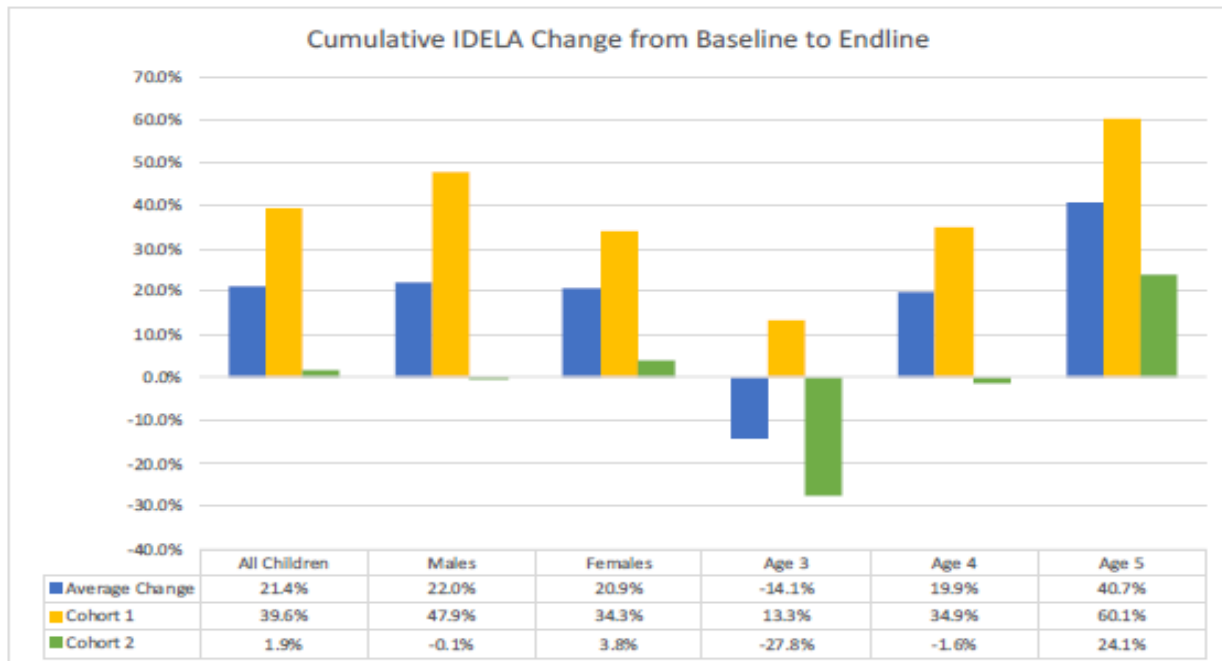


achieved by five-year-olds in cohort 2. Additionally, three-year-old children in cohort 1 scored an average 18% on literacy, which is higher than the average 17% scored by 5-year-old children (two age groups higher) in cohort 2.

Older children benefitted most from the curriculum. Age 5 children in cohort 1 experienced an average 60.1 percentage point increase across the four domains. While the program remained impactful for younger students, increases in scores tended to be smaller with age four and age three children in cohort 1, who experienced an increase in overall score by an average 34.9 and 13.3 percentage points, respectively.

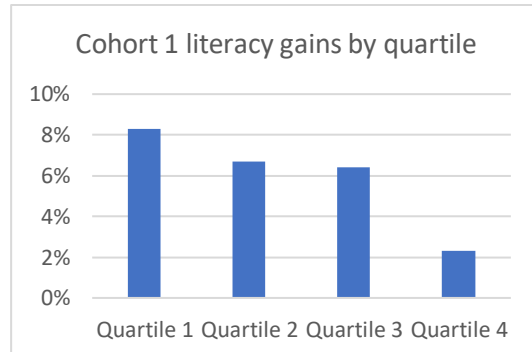
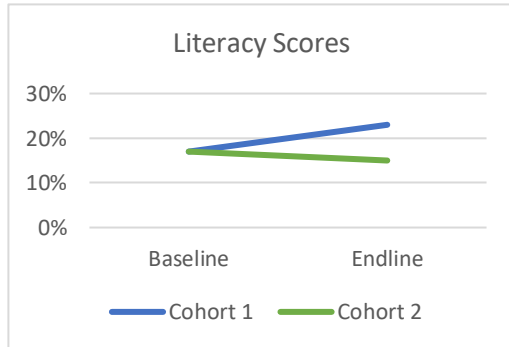
This demonstrates the importance of children receiving the program at the appropriate age, and the importance of early enrichment. Exploring cohort 2 results across age demonstrates the importance of early stimulation. Age 5 children are the only age group in cohort 2 to experience an overall average improvement (24.1 percentage points) across IDELA domains within the year. Meanwhile, average scores for Age 3 and Age 4 students were found to decrease, with age 3 children’s scores going down by an average 27.8 percentage points, further demonstrating the importance of early stimulation in ensuring developmental gains.

Gender. Gender does not have a statistically significant relationship with scores across any of the four IDELA domains, controlling for age and cohort placement. Cohort 1 girls and boys experience similar gains through participating in Dengbe Bide, which exceed gains by girls and boys in cohort 2. That said, persistent gaps exist between male and student scores at baseline and endline. Boys received consistently higher IDELA scores than girls, regardless of cohort assignment. This points to systemic gender disparities in child development in target communities, and the need for Dengbe Bide to do more to address them.



Literacy

Placement in cohort 1 significantly predicts literacy score, with an 8.5 percentage point increase for students in cohort 1 over those in cohort 2, when controlling for age and gender. Average literacy scores for children in cohort 1 increased 6 percentage points to 23% at endline, while the average score for cohort 2 decreased two percentage points to 15%.



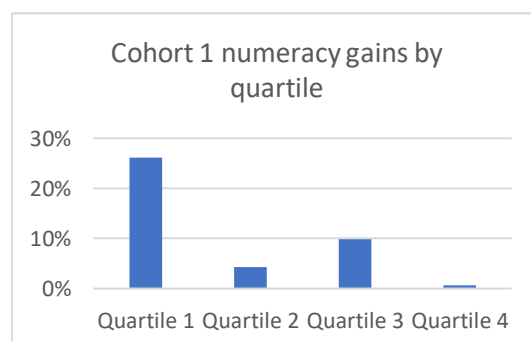
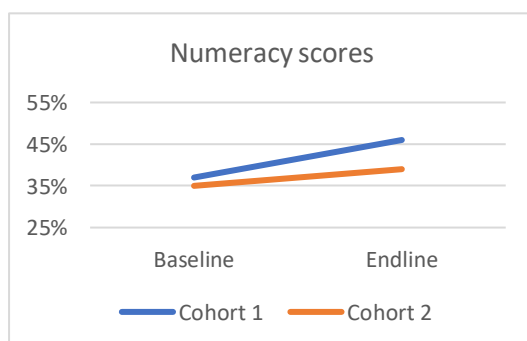
Age. Age has a significant relationship with literacy scores across cohort and gender, with each year of age associated with an increase in the literacy score by 5.3 percentage points. Growth in scores with age appears greater for cohort 1 students, although this relationship is not statistically significant. Results show that the age of receiving the program matters, with older children experience greater gains. Matched five-year-olds from cohort 1 experienced the largest increase in literacy IDELA, jumping 14 percentage points from 23% at baseline to 37% at endline. This is much larger than for three-year-olds from Cohort 1, whose average increase was just 3 percentage points from 12% to 15%.

Baseline score. Learners in the lowest-performing quartiles gained the most from program participation. Children who scored in the lowest quartile at baseline gained 8.2 percentage points, while children in the second and third lowest gained 6.7 and 6.4 percentage points, respectively. This indicates that Dengbe Bide provides the biggest boost to learners with the greatest need.

Gender. The positive impact of the program on cohort 1 was especially pronounced for females, who started with an average literacy score below females in cohort 2, and by endline scored on average 5 percentage points higher than their female counterparts.

Numeracy

Numeracy has a positive but statistically insignificant relationship with cohort assignment, controlling for age and gender. Cohort 1 children gained nine percentage points from baseline to endline as compared with a two percentage point decline in scores in Cohort 2. This corresponds to a 24% increase in scores for Cohort 1, compared to 11% in Cohort 1. Comparing baseline scores between the two cohorts, the average numeracy score of students in cohort 1 was slightly higher (2 percentage points) than those of Cohort 2.



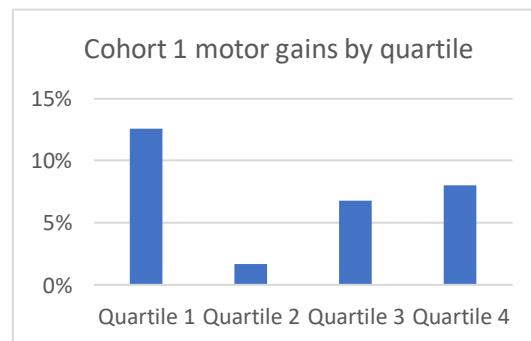
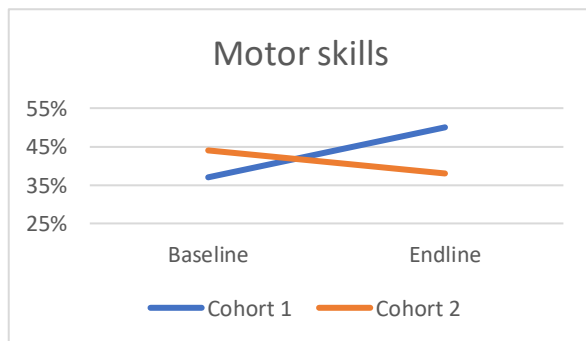
Baseline score. The lowest-scoring learners benefit the most from program participation. Children who scored in the lowest score quartile at baseline gained 26.2 percentage points, while children in higher quartiles made more modest gains. This indicates that the Dɛngbɛ Bide program helps lowest-performing learners catch up to their peers.

Age. Younger children in cohort 1 outperformed older children in cohort 2 in numeracy. Four-year-old students in cohort 1 scored an average of 14 percentage points higher than cohort 2 five-year-olds. Five-year-olds from cohort 1 show the largest increase in numeracy IDELA, with an increase of 17 percentage points from 44% to 61%. This is much larger than for three-year-olds from Cohort 1, whose average increase was just 6 percentage points from 32% to 38%. Scores for three-year-olds in Cohort 2 decreased slightly from baseline to endline.

Gender. In regards to gender, the effects of program participation were especially pronounced for females in cohort 1, who started with an average numeracy score below that of Cohort 2, and by endline scored on average 3 percentage points higher than females in Cohort 2

Motor skills

Placement in cohort 1 has a positive relationship with motor scores. Comparing scores at baseline, average motor score was higher by 7 percentage points for children in Cohort 2. The average motor score for cohort 1 students increasing by 13 percentage points to 50%, resulting in cohort 1 outscoring cohort 2 by 12 percentage points at endline. The average score for children in Cohort 2 decreased by 6 percentage points.



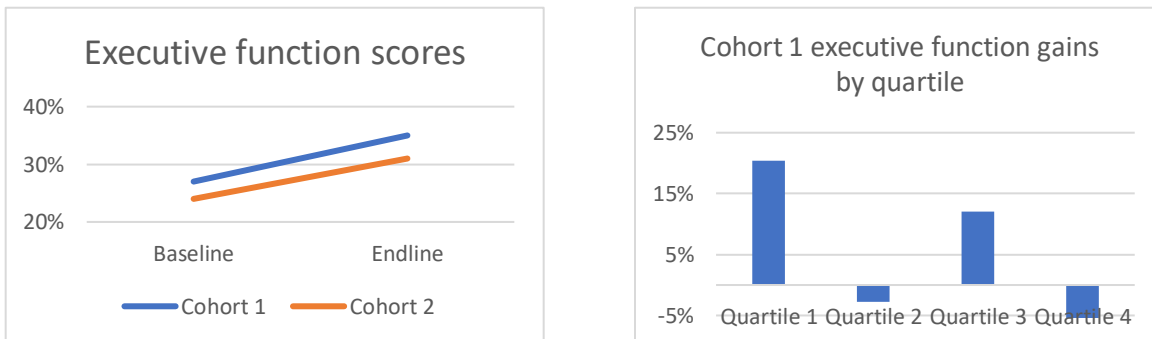
Baseline score. As with other domains, children in the lowest score quartile at baseline exhibited the largest gains in IDELA motor score. However, unlike other domains, children in the highest quartile outperformed those in the second and third quartiles. This indicates that children at the ends of the spectrum of scores benefit the most from the program, while children in middle performance ranges make smaller gains.

Age. Child age has a significant relationship with motor score. When controlling for gender and cohort placement, each year of age is associated with an increase in average motor score by 12 percentage points. Results show that the age of receiving the program matters. Five-year-olds from Cohort 1 experienced the largest increase in motor score, improving 16 percentage points from 49% to 65%. This is larger than the effect of the program on 3-year-olds in cohort 1, whose average improvement was 12 percentage points from 27% to 39%.

Gender. The positive impact of the program on cohort 1 was especially pronounced for females, who experienced a nine percentage point increase in average score compared to a four percentage point increase for males in the same cohort.

Executive Function

Placement in cohort 1 had a positive but small relationship with executive function score. Comparing executive function scores between the two cohorts, average score at baseline was slightly higher (3 percentage points) for students in cohort 1. Cohort 1 children's average executive function score increased by 8 percentage points to 35%, 4 percentage points higher than Cohort 2.



Baseline score. As with other domains, children who had the lowest baseline score experienced the largest growth in IDELA executive function score. Children in the third quartile outperformed those in the second and fourth, while children in the second and fourth quartiles experienced an overall decrease in score on average.

Age. Child age has a consistently significant relationship with executive function score. When controlling for gender and cohort, each year is associated with an increase in executive function score by an average 9.8 percentage points. Results show that the age of receiving the program matters. Four- and five-year-olds from Cohort 1 experienced the largest increase in executive function scores, with an average increase of 9 percentage points each across the two age groups. This is larger than for 3 year-olds from Cohort 1, whose average score improvement was just 6 percentage points.

Gender. The positive impact of the program on Cohort 1 was especially pronounced for females, who experienced a six percentage point increase in average score compared to a two percentage point decrease for males in the same cohort.

Approaches to learning

Here we report scores on each of the two clusters of items that measure children's approaches to learning. The first cluster relates to the child's overall approach to learning and is comprised of a series of ratings by the enumerator at the end of the assessment on seven aspects of the child's approach to learning throughout the assessment. The second cluster measures the child's approach to learning for specific tasks and is comprised of two questions placed at the end of five challenging IDELA items. Children are rated with a score of 3 if they always display the given approach to learning, 2 if they display it often, 1 if sometimes and 0 if never. A summary of the questions in each cluster is below.

Overall approaches to learning results

Across cohorts, ages, and genders, children who have more positive attitudes towards new and challenging tasks also tend to perform better on the IDELA assessment. This is most pronounced for motor skills, with a unit change in a child's overall approach to learning score (for example, an increase from "never" to "sometimes" across all items) associated with a 23-percentage point score difference, controlling for age, gender, and cohort placement. Numeracy and executive function also exhibit a sizeable increase, with a unit change in a child's overall approach to learning associated with a 15-percentage point difference scores controlling for age, gender and cohort. Finally, a unit change in in a child's overall approach to learning score is associated with a 10-percentage point improvement in literacy IDELA. We find a small and inconsistent relationship between cohort placement and overall approaches to learning. Among children with similar literacy and motor skills, placement in cohort 1 has a significant impact on overall approaches to learning, but this relationship is not observed for numeracy and executive function scores

Age and gender. As would be expected, approaches to learning have a significant positive relationship with the age of the student, when controlling for other IDELA domain scores, gender, and cohort assignment. Meanwhile, gender was not found to have a significant relationship with approach to learning, except when controlling for motor skills.

Task-based approach to learning results

Regression analysis shows a statistically significant relationship between task-based approaches to learning and IDELA scores across all four domains. A unit change in a child's task-based approaches to learning score (for example, an increase from "sometimes" to "often" across all items) is associated with a 18-percentage point difference in IDELA motor score, a 14-percentage point difference in IDELA executive score, a 12.5-percentage point difference in IDELA numeracy score, and a 8-percentage point difference in IDELA literacy score, controlling for age, gender and cohort placement. Among children with similar literacy scores, placement in cohort 1 has a significant relationship with task-based approaches to learning, but this relationship is not observed for motor, numeracy or executive function scores.

Age and gender. As would be expected, task-based approaches to learning have a significant positive relationship with age of the student. Meanwhile, gender was not found to have a significant relationship with approach to learning, except when controlling for motor skills.

Instructional quality

Key take-aways

- **Fidelity of implementation.** Ninety percent of Dɛngbɛ Bide teachers deliver the curriculum with high degrees of fidelity to its original design.
- **Process quality.** All Dɛngbɛ Bide teachers achieve high levels of process quality, indicating nurturing, constructive, and engaging relationships with learners.
- **Structural quality.** Seventy percent of Dɛngbɛ Bide classrooms are rated as safe, joyful, and healthy.
- **Overall quality.** Ninety percent of Dɛngbɛ Bide teachers achieve high levels of overall instructional quality.

Overall instructional quality

Impact of instructional quality on performance

Dɛngbɛ Bide assessed teacher instructional quality through classroom observations. Regression analysis on teachers' instructional quality and their children's learning outcomes allow for an exploration of the impact of teaching practices on IDELA scores, controlling for age and gender. As only Cohort 1 received the intervention, we regressed data for the 20 teachers in Cohort 1 villages. Instructional quality scores are a composite measure of fidelity of implementation (how closely the teacher delivers the lessons as intended), process quality (the nature of the teacher-child interaction, both in terms of instruction and classroom management), and structural quality (the adequacy of the physical classroom environment).

Numeracy. There is a significant positive relationship between overall instructional quality and numeracy skills. A ten-percentage point change in a teacher's overall instructional quality score (for example, from 75% to 85%) predicts an eight-percentage point change in a child's numeracy IDELA score. There is also a significant positive relationship between teachers' process quality scores and children's numeracy IDELA scores. A 10-percentage point change in a teacher's process score predicts a 5-percentage point change in a child's numeracy IDELA score. Fidelity of implementation has a small and insignificant relationship with numeracy scores, while structural quality had a negligible and insignificant relationship, controlling for age and gender.

Literacy. There are no statistically significant relationships between classroom observation data and children's literacy IDELA scores.

Motor. Regression analysis shows that there is an insignificant positive relationship between overall instructional quality and children's motor scores. A 10 percentage point increase in overall score corresponds to a seven percentage point increase in motor scores. Process quality also has a positive but statistically insignificant relationship with motor skills, with a 10 percentage point increase corresponding to a 5.6 percentage point gain in motor skills.

Executive function. Overall classroom environmental quality has a positive but insignificant relationship with executive function. Teachers with 10 percentage point higher overall instructional quality scores tend to have students with executive function skills that are 7 percentage points higher, controlling for age and gender.

Perceptions of Baka Culture

Caregiver perceptions of education and the future.

Preservation of Baka culture. Caregivers view Baka culture as a robust and critical part of their modern everyday life. They almost universally noted that Baka traditional knowledge consists of a suite of essential livelihood skills that children must master in order to become successful adults. Baka culture is fundamental to their daily life and livelihoods, and represents a suite of skills that are vital for children to master. Caregivers feel responsible for transmitting this knowledge to children. At the same time, caregivers acknowledge that Baka culture is under threat. They feel responsible for ensuring that children learn Baka language and traditions in order to understand them and carry them forward for future generations.

Caregivers recognize that children must master both Baka and French/mainstream languages and cultures in order to thrive into adulthood. Caregivers therefore find it important to elevate Baka traditional knowledge and language to the same level of importance as formal schooling. Not doing so serves to elevate French and mainstream culture and relegate Baka culture to a lower value. Caregivers acknowledge that Baka culture is under threat, and that devaluing Baka culture contributes to its disappearance. Integrating culture into schooling is critical to ensure that both are considered valuable. To prevent the disappearance of these traditions, they emphasize the importance of elevating traditional knowledge to the same level as academic skills.

While caregivers across villages tended to emphasize the importance of learning Baka traditional knowledge, there were qualitative differences in their responses at endline. After one year of implementation caregivers in cohort 1 villages were more likely to say that it is important for Baka children to learn about their culture in order to preserve, understand, and practice it. In control villages, however, caregivers were more likely to dismiss the need to learn Baka culture in favor of learning school-based skills and French language.

Perceptions of the program. Our analysis finds that caregivers perceive Dɛngbɛ Bide as a key tool in their fight for educational equity and justice. Caregivers view Dɛngbɛ Bide's emphasis on Baka language and culture as an asset. They appreciate that it elevates "Baka language and culture to the same level as French and other topics taught in formal schooling." They see this emphasis as important for helping children learn to appreciate their culture, and prepare to succeed in primary school, and be active members of broader society. Caregivers overwhelmingly highlighted a nurturing relationship as the most important job skill for a Dɛngbɛ Bide teacher. Caregivers in cohort 1 villages noted that Dɛngbɛ Bide teachers were dedicated role models to "chasing two rabbits at once." Traits that one may expect parents to view as important in a teacher, such as academic background, professional certification, or French language skills were not raised at all. Instead, caregivers repeatedly emphasized the importance of caring, loving, and dedicated adults to children's success in school and in life.

Caregivers view participation in Dɛngbɛ Bide as offering a leg-up in society, as with other institutions of the formal education system. They see Dɛngbɛ Bide as a tool for social mobility, and a long-term investment for Baka people. The program supports learners "to be responsible for their future, to be responsible to authorities, to be representatives for our tribe, to have our children in high positions, and to elevate ourselves intellectually." Caregivers perceive that the program can support children to succeed in different levels of formal education, better positioning them to participate in different aspects of civic and social life and represent the Baka people in diverse fora. School is a gateway to respect, authority, connection to others, and literacy is key to this mobility. While recognizing that it is currently just a preschool program, caregivers emphasized that the use of Baka language and cultural references is a key element they wish to see continue into upper grades.

Teacher and caregiver perceptions of children's school readiness

Caregivers. Regarding their children's readiness for school, caregivers repeatedly noted that their children are smart and capable of learning, but that they encounter significant obstacles to success in school. Like all other children transitioning from home to school for the first time, Baka children face an unfamiliar environment that is intimidating. They described meeting their teacher and classmates and operating in a classroom for the first time is new and can be scary. Caregivers note that "Baka children are generally wise, but they flee school because it is a new environment and they feel intimidated by Bantu children." Caregivers emphasize that the school environment is different from what children experience at home, noting particularly that the presence of Bantu teachers and peers can cause feelings of fear and frustration. Ethnic tensions consistently arose as a driver of drop-out and poor performance. Caregivers highlighted that children are intimidated by and afraid of their Bantu peers, and often their teachers as well. Caregivers attribute this to superiority complexes among Bantu children that leads to bullying and stigma. Despite these challenges, caregivers observe that children are learning effectively in Dɛngbɛ Bide. Their main evidence for this is children's repetition at home of lessons learned at the center. Caregivers see children bring learning into the home by sharing what they learned in school with caregivers and siblings through play and conversations. Specific actions that caregivers highlighted include writing on doors and walls, singing songs, reciting lessons, and generally exhibiting more positive behaviors.

Caregivers in cohort 1 villages appear to have a greater appreciation of their children as learners. While many teachers and caregivers noted that Baka children struggle in primary school, families in cohort 1 villages after one year of program participation adopted a more nuanced view. They noted that their children need lots of practice and play to learn new things, and emphasize the importance of toys, group interactions, and opportunities to apply new skills in learning. This corresponds with the notion that children's skills can grow through enriching experiences (also known as plasticity), and the idea that children's skills and knowledge are not fixed but improve with practice (also known as growth mindset). These are concepts that Dɛngbɛ Bide works hard to instill these ideas in teachers and learners, and it appears that caregivers have also taken them to heart. Finally, caregivers in cohort 1 were more likely at endline to say that their child was successfully confronts ethnic tensions and is able to interact confidently with Bantu children and adults.

Government primary school teachers. Formal government primary school teachers consistently rated Bantu (non-indigenous agriculturalists that comprise the predominant ethnic group) children as being readier for school than Baka children. According to these teachers, Bantu Children are more likely to enter school with some knowledge of letter names and sounds, French language, and basic math than Baka children. However, they note that Baka children come to school as excited and confident to learn as Bantu children, although they appear to have less ability to focus and follow along in class. Overall, teachers view Baka children as arriving to school less ready to learn than their Bantu counterparts.

When asked to explain these differences, formal primary school teachers highlighted many traits of Baka children as both strengths and weaknesses when it comes to school readiness.

The challenges that teachers identified Baka children face appear to revolve around the idea that Baka children are isolated from Bantu society and cultural influences. They observe Baka parents to be negligent and dependent on others; Baka children as afraid of Bantu children; and Baka children as lacking in French language skills. Teachers did not explicitly raise greater integration of Bantu and Baka

children as a solution, but their problems they raised seem to revolve around the theme of insufficient integration of Baka and Bantu children

Primary school teachers perceive that caregivers play a significant role in influencing their children's success in school. By providing (or not providing) learning opportunities, supervision, encouragement, and food, among other types of support, Baka caregivers determine whether their children are prepared and motivated to succeed in school. Lack of support from caregivers was the most commonly cited reason among teachers for Baka children's struggles in primary school. Teachers attribute this to caregivers' lack of awareness of the importance of school. Teachers argue that when parents fail to provide learning opportunities, supervision, encouragement, and adequate food, Baka children are not prepared and motivated to succeed in school.

Regarding fear of Bantu children, teachers regularly noted that Baka children have trouble socializing with other children at school. They note that Baka children tend to exhibit "fear, lack of confidence, and shyness" around their Bantu peers, and attribute this to ethnic tensions that begin outside of the classroom and lead to feelings of inferiority among Baka children. Many primary teachers linked these challenges to inter-ethnic relationships, and felt that Baka children are overwhelmed by bullying that they face from Bantu children, which causes them to turn inwards, stop participating, and even stop attending class. Other teachers felt Baka children lack confidence and social skills, and believed these can only be built with repeated exposure to Bantu children in classroom environments.

Teachers noted that Baka children have some foundational skills at the start of school that support their success. The most commonly noted skills were in singing, play, oral language, and drawing. One of the sampled villages was the original pilot village for the Dengbe Bide feasibility test from 2015-2017. Here, teachers noted that Baka children arrive to school with foundational academic skills in language, math, and music. This may indicate that Dengbe Bide alumni are arriving to primary school with improved academic skills. French language was highlighted most frequently as a gap for Baka children.

As primary teachers will have their first interactions with Dengbe Bide children once alumni matriculate into primary schools, we did not gather midline data from them.

Annex B: Regression Outputs

Multivariate regression models for IDELA numeracy scores

Numeracy					
	1	2	3	4	5
Age	0.0637** (3.81)	0.0583** (3.62)	0.0576** (3.46)	0.0492* (2.30)	0.0577** (3.40)
Female		-0.0392 (-1.29)	-0.0459 (-1.49)	-0.0460 (-1.49)	-0.0416 (-0.86)
Cohort 1			0.0487 (1.19)	-0.0120 (-0.09)	0.0524 (1.12)
Cohort 1 x Age				0.0148 (0.44)	
Cohort 1 x Female					-0.00736 (-0.12)
Constant	0.157* (2.27)	0.200** (3.05)	0.178* (2.77)	0.213* (2.66)	0.176* (2.35)
Observations	198	198	198	198	198
t statistics in parentheses					
="* p<0.05		** p<0.01		*** p<0.001"	

Multivariate regression models for IDELA literacy scores

Literacy					
	1	2	3	4	5
Age	0.0577*** (4.15)	0.0542*** (4.12)	0.0527*** (4.97)	0.0286* (2.19)	0.0531*** (4.85)
Female		-0.0262 (-1.18)	-0.0375 (-1.60)	-0.0379 (-1.64)	-0.00252 (-0.07)
Cohort 1			0.0854*** (4.15)	-0.0887 (-0.99)	0.115** (3.79)
Cohort 1 x Age				0.0422 (1.99)	
Cohort 1 x Female					-0.0601 (-1.27)
Constant	-0.0417 (-0.76)	-0.0137 (-0.26)	-0.0512 (-1.17)	0.0481 (0.79)	-0.0684 (-1.35)
Observations	196	196	196	196	196
t statistics in parentheses					
="* p<0.05		** p<0.01		*** p<0.001"	

Multivariate regression models for IDELA motor scores

Motor	1	2	3	4	5
Age	0.126*** (4.37)	0.118*** (4.07)	0.117*** (4.10)	0.129** (2.95)	0.117*** (4.05)
Female		-0.0792* (-2.53)	-0.0918** (-2.89)	-0.0919* (-2.87)	-0.0810 (-1.91)
Cohort 1			0.0904 (1.53)	0.173 (0.74)	0.0993 (1.65)
Cohort 1 x Age				-0.0198 (-0.35)	
Cohort 1 x Female					-0.0186 (-0.30)
Constant	-0.0994 (-0.82)	-0.0241 (-0.20)	-0.0685 (-0.58)	-0.116 (-0.66)	-0.0730 (-0.59)
Observations	188	188	188	188	188
t statistics in parentheses					
=** p<0.05		** p<0.01		*** p<0.001"	

Multivariate regression models for IDELA executive function scores

Executive	1	2	3	4	5
Age	0.105*** (4.56)	0.0981*** (4.04)	0.0980*** (4.01)	0.110** (3.08)	0.0982** (3.90)
Female		-0.0515 (-1.44)	-0.0530 (-1.45)	-0.0528 (-1.42)	-0.0325 (-0.66)
Cohort 1			0.0106 (0.35)	0.0999 (0.54)	0.0279 (0.61)
Cohort 1 x Age				-0.0217 (-0.46)	
Cohort 1 x Female					-0.0349 (-0.50)
Constant	-0.107 (-1.18)	-0.0505 (-0.49)	-0.0553 (-0.54)	-0.107 (-0.72)	-0.0650 (-0.58)
Observations	198	198	198	198	198
t statistics in parentheses					
=** p<0.05		** p<0.01		*** p<0.001"	

Multivariate regression models for overall IDELA approaches to learning scores

Relationship between Overall Approach and IDELA Scores:				
	Numeracy	Literacy	Motor	Executive
Overall Approach Average	0.149*** (5.80)	0.104*** (6.16)	0.226*** (4.87)	0.155*** (4.99)
Age	0.0584* (2.78)	0.0534** (3.70)	0.129*** (4.54)	0.0988** (3.66)
Female	-0.0222 (-0.85)	-0.0217 (-0.98)	-0.0702** (-3.02)	-0.0283 (-0.75)
Cohort 1	0.0518 (1.62)	0.0868*** (4.63)	0.0960* (2.19)	0.0137 (0.48)
Constant	-0.0850 (-0.94)	-0.234** (-3.33)	-0.515** (-3.71)	-0.328* (-2.66)
Observations	198	196	188	198
t statistics in parentheses		**		
=** p<0.05	p<0.01	*** p<0.001"		

Multivariate regression models for task-based IDELA approaches to learning scores

Relationship between Task-Based Approach and IDELA Scores:				
	Numeracy	Literacy	Motor	Executive
Task-Based Approach to Learning Score	0.125*** (4.98)	0.0805** (3.52)	0.181*** (4.47)	0.138** (3.69)
Age	0.0590* (2.80)	0.0569** (3.80)	0.141*** (4.86)	0.101*** (3.93)
Female	-0.0365 (-1.38)	-0.0264 (-1.14)	-	-0.0379 (-1.02)
Cohort 1	0.0424 (1.20)	0.0906*** (4.43)	0.0803 (1.73)	0.00830 (0.27)
Constant	-0.0339 (-0.35)	-0.207* (-2.34)	-0.488** (-3.33)	-0.297* (-2.26)
Observations	180	178	176	180
t statistics in parentheses		**		
=** p<0.05	p<0.01	*** p<0.001"		

Multivariate regression models for teacher quality of instruction and numeracy scores

Teacher Observation vs. Numeracy				
	Fidelity	Process	Structural	Overall
Age	0.0713** (3.04)	0.0568* (2.48)	0.0631** (2.70)	0.0639** (2.82)
Female	-0.0574 (-1.85)	-0.0448 (-1.49)	-0.0468 (-1.52)	-0.0509 (-1.70)
Fidelity	0.286 (1.60)			
Process		0.539* (2.23)		
Structural			0.0469 (0.27)	
Overall				0.775* (2.39)
Constant	-0.0303 (-0.17)	-0.211 (-1.00)	0.170 (1.07)	-0.386 (-1.45)
Observations	116	116	116	116
t statistics in parentheses =** p<0.05 ** p<0.01 *** p<0.001"				

Multivariate regression models for teacher quality of instruction and literacy scores

Teacher Observation vs. Literacy				
	Fidelity	Process	Structural	Overall
Age	0.0705*** (3.50)	0.0707*** (3.57)	0.0656** (3.33)	0.0683*** (3.47)
Female	-0.0622* (-2.36)	-0.0602* (-2.33)	-0.0559* (-2.16)	-0.0602* (-2.32)
Fidelity	0.0866 (0.57)			
Process		-0.209 (-1.01)		
Structural			0.189 (1.30)	
Overall				0.206 (0.74)
Constant	-0.0878 (-0.58)	0.144 (0.79)	-0.149 (-1.13)	-0.174 (-0.76)
Observations	114	114	114	114
t statistics in parentheses =** p<0.05 ** p<0.01 *** p<0.001"				

Multivariate regression models for teacher quality of instruction and executive function scores

Teacher Observation vs. Executive				
	Fidelity	Process	Structural	Overall
Age	0.0895** (2.82)	0.0836** (2.66)	0.0825** (2.65)	0.0867** (2.81)
Female	-0.0740 (-1.76)	-0.0690 (-1.68)	-0.0649 (-1.58)	-0.0730 (-1.79)
Fidelity	0.112 (0.46)			
Process		0.228 (0.69)		
Structural			0.297 (1.29)	
Overall				0.675 (1.53)
Constant	-0.0788 (-0.33)	-0.162 (-0.56)	-0.196 (-0.93)	-0.500 (-1.38)
Observations	116	116	116	116
t statistics in parentheses				
="* p<0.05 ** p<0.01 *** p<0.001"				

Multivariate regression models for teacher quality of instruction and motor scores

Teacher Observation vs. Motor				
	Fidelity	Process	Structural	Overall
Age	0.109** (2.85)	0.101** (2.72)	0.105** (2.82)	0.109** (2.93)
Female	-0.102* (-2.05)	-0.0968* (-2.00)	-0.0981* (-2.01)	-0.105* (-2.16)
Fidelity	0.0309 (0.11)			
Process		0.563 (1.45)		
Structural			0.198 (0.71)	
Overall				0.704 (1.35)
Constant	0.0408 (0.14)	-0.369 (-1.09)	-0.0740 (-0.29)	-0.472 (-1.10)
Observations	109	109	109	109
t statistics in parentheses				
="* p<0.05 ** p<0.01 *** p<0.001"				