Center for Universal Education at BROOKINGS

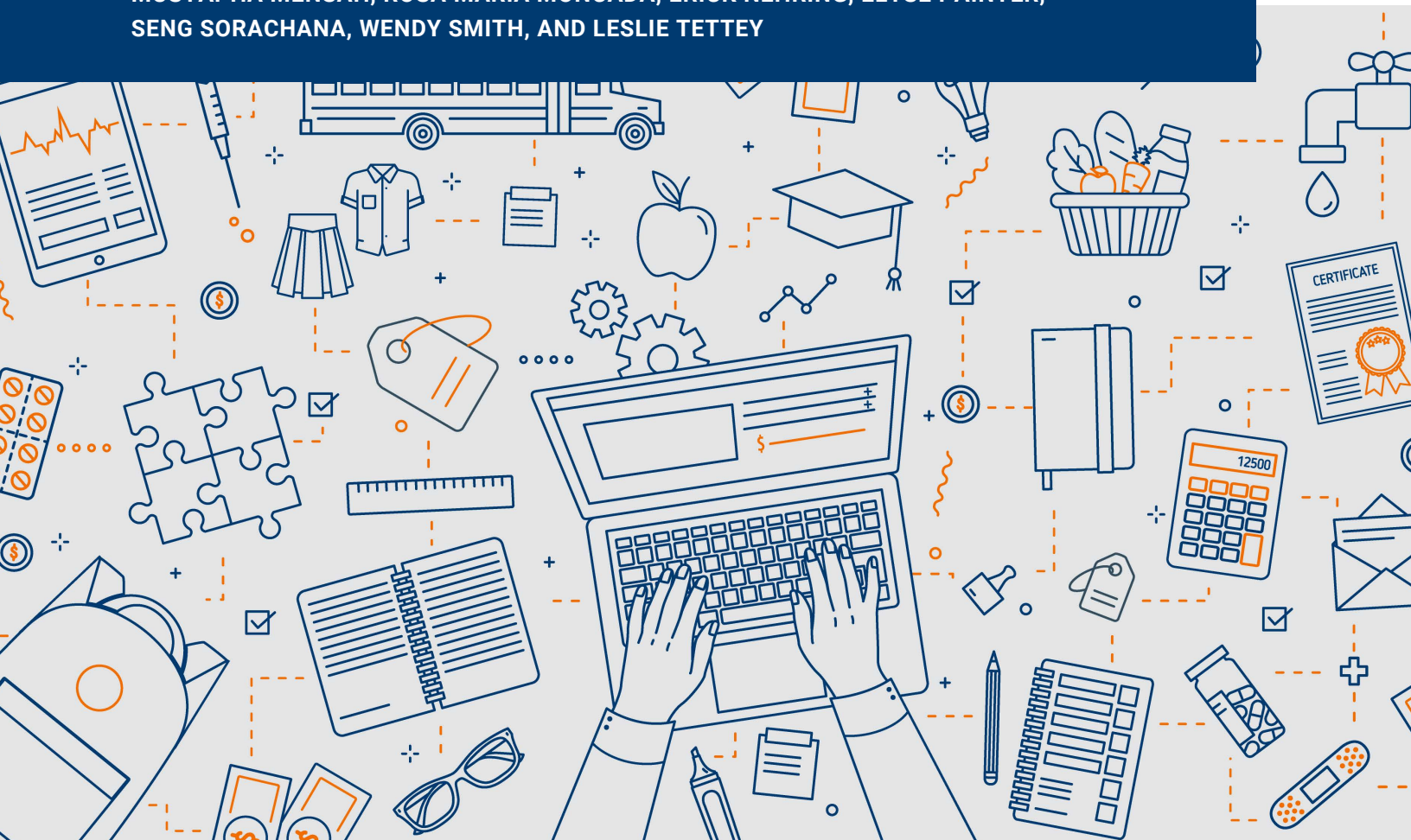
REPORT

SEPTEMBER 2023

THE CHILDHOOD COST CALCULATOR (C3)

A SIMPLE TOOL FOR COSTING INTERVENTIONS FOR CHILDREN AND YOUTH

CLEMENT ADAMBA, DANTE CASTILLO-CANALES, CHHORN LIN, EMILY GUSTAFSSON-WRIGHT, MUSTAPHA MENSAH, ROSA MARÍA MONCADA, ERICK NEHRING, ELYSE PAINTER, SENG SORACHANA, WENDY SMITH, AND LESLIE TETTEY



The Childhood Cost Calculator (C3): A simple tool for costing interventions for children and youth

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Introduction

It is incontestable that the well-being of today's children and youth will determine the future of the planet. For young people to develop and thrive, sound investments must be made across multiple sectors including health, nutrition, social protection, and education. The COVID-19 pandemic has both hampered progress toward meeting the sustainable development goals (SDGs) related to children and youth and highlighted the interconnectedness across these sectors. Pandemic-related setbacks have been observed in child and youth-centered targets in several domains including health (SDG 3), education (SDG 4), gender equality (SDG 5), and economic growth (SDG 8). UNESCO estimates that there are 244 million children and youth out-of-school, and progress at lowering this rate had already stalled before the pandemic (Global Education Monitoring Report Team and UNESCO Institute for Statistics, 2022). In just three years, learning poverty jumped from an already unacceptable level of 57 percent of 10-year-olds in low- and middle-income countries unable to read and comprehend a simple text in 2019 to 70 percent in 2022 (World Bank et al., 2022). Further complicating this is the fact that of the $5 trillion spent yearly around the globe on education, a mere 0.5 percent is spent in low-income countries while two-thirds is spent in the wealthiest nations (UNESCO, n.d.). And while improvements have been made in child malnutrition since the beginning of the century, in 2022 nearly a quarter of children under 5 (22.3 percent) were stunted (UNICEF, 2023). Almost half of all deaths of children under five are due to malnutrition, and those that survive chronic malnutrition in their childhood can be impacted for life. Stunted children are less likely to achieve in school, have diminished ability to learn, and are less likely to attain formal employment (UNICEF, 2023; Oot et al., 2016).

To address the learning crisis and other challenges facing children and youth (those 15-24 years of age) it is critical for governments, multilateral and bilateral funders, other donors, and implementers to have a clear understanding of program costs and cost breakdowns to inform financing decisions. The World Bank pointedly notes that "countries should develop and *cost* evidence-based plans for achieving their learning goals and a road map for *financing* those plans" to improve outcomes (Arias and Kheyfets, 2023, emphasis added). Cost data are a critical component of cost-effectiveness analysis, which is imperative to ensuring the best use of limited resources. Indeed, cost data are needed for advocacy, budgeting and planning, and resource allocation in all sectors. While cost is not the only factor to consider, it is a critical one that is often overlooked due to such issues as a lack of accessible high-quality cost data, low capacity to conduct cost analysis, an aversion to transparency, or simply low prioritization of data collection and analysis. Several studies have shown that even at the highest levels, most evaluations of programs and initiatives do not include cost data analysis (Brown & Tanner, 2019; Velez, 2020).

For nearly a decade, the Center for Universal Education (CUE) at the Brookings Institution has led the Childhood Cost Data initiative, a research project focused on the collection, analysis, and use of cost data to increase the volume and quality of funding for programs targeting children and youth. The initiative's end goal is to improve learning and life outcomes for the youngest generation through these advancements. As part of this initiative, Brookings developed the Childhood Cost Calculator (C3), intended to facilitate cost analysis. This study introduces C3, the tool's various dimensions and functionalities, and presents learnings from three case studies from piloting the calculator in the

education or early childhood development (ECD) sectors in Cambodia, Ghana, and Honduras. It concludes with suggestions for a way forward that supports funders, implementers, and researchers to better use cost data to make strides in tackling the multiple crises facing children and youth today.

History of the Childhood Cost Data initiative at Brookings

In 2014, CUE began conducting research specifically focused on the cost of delivering quality ECD interventions in low- and middle-income countries. The goal was to inform policymakers on the average costs of delivering ECD services in each country so that this information could be used for advocacy, budgeting, planning, and the implementation of quality ECD programming. The team rapidly discovered that the data were scarce and that where data did exist, they were not comparable due to methodological inconsistencies in their estimation due to the variation in costing models used. Additionally, there were no publicly available costing tools focusing on programming for young children across a variety of sectors. Furthermore, it became apparent that while there was a high demand for cost data among some actors, capacity and political constraints were hampering their collection. Finally, the research uncovered the fact that costing has primarily been driven by funders and researchers external to the programs and countries themselves, failing to strengthen capacity on the ground and allow for ownership of the data (Manuelyan Atinc et al., 2014; Putcha and Van der Gaag, 2015).

To attempt to address these gaps and challenges, CUE developed the Standardized ECD Costing Tool (SECT) aimed at providing quality cost data with methodological consistency for a range of ECD interventions across a diversity of contexts which could then be used by policymakers, funders, program implementers, and researchers to inform effective investment decisions. Through piloting the tool in five countries (Bangladesh, Malawi, Mali, Mexico, and Mozambique), in partnership with the World Bank's Strategic Impact Evaluation Fund, the team and partners learned a great deal about the challenges and limitations of costing. These challenges included difficulties in accessing cost data, defining cost categories, and making cost assumptions, to name a few. Additionally, the piloting uncovered that the SECT tool itself was not sufficiently user-friendly for it to be used independently by non-expert users (Gustafsson-Wright et al., 2017). The tool had not addressed the failings of other tools in the sector in terms of accessibility. These learnings informed the design of the Brookings Childhood Cost Calculator (C3), a revised, more user-friendly, and publicly accessible tool to replace SECT which was expanded to include a variety of interventions targeting children and youth across multiple sectors (Education, Health, Nutrition, Social Protection, Water and Sanitation, and Governance).

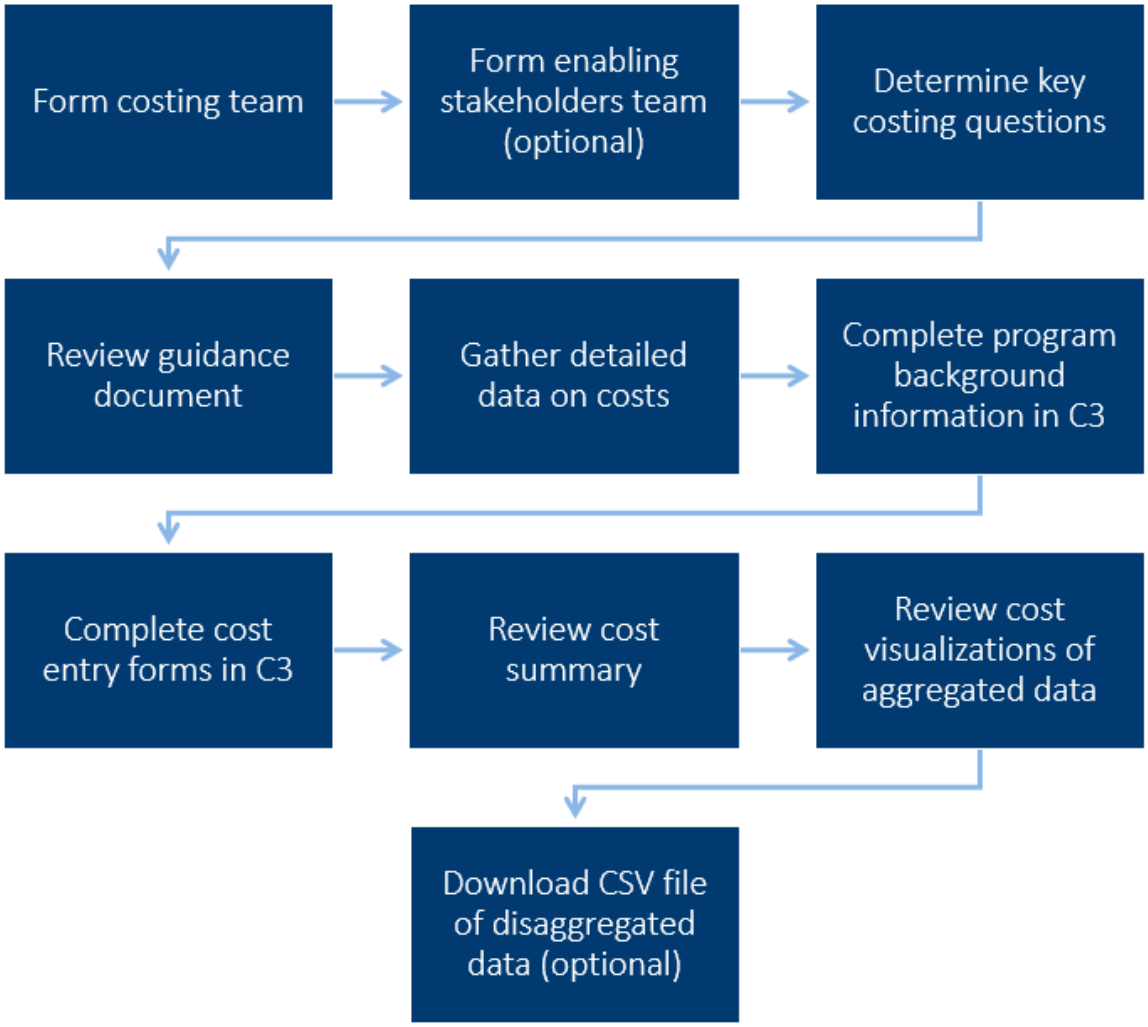
While Brookings worked to develop, pilot, and refine C3, the global development community continued to make further strides in costing including through a few guidance documents and tools, as seen in Appendix A1. Each of these guidance documents and tools will be an important part of a larger effort to increase the quality and quantity of various types of cost data globally by supporting different needs, populations, and contexts as well as varying levels of capacity. However, many of the currently available tools require significant training prior to their use or an external expert consultant, are developed and targeted to either specific intervention types or populations (such as the EiE Cost Capture Template,) or must be used mainly within or by a specific organization (such as the USAID Education Cost Analysis Guidance and Templates). In addition to these guidance documents and tools, our research also

uncovered a systematic review of older tools specific to the health sector as well as additional earlier costing models within the ECD sector that current work builds upon (Bitran y Asociados and PATH, 2008; Gustafsson-Wright and Boggild-Jones, 2018). C3 makes an important contribution as a user-friendly free public good that goes beyond a single sector to encompass a range of child and youth-centered interventions, allowing for improved comparison and consistency without the requirement of an economist or an outside expert.

The Childhood Cost Calculator

C3 was built on RTI International's Tangerine software platform which allows the user to enter cost-related data in a straightforward survey form. The tool, which can be accessed freely online, can provide a range of calculations, estimates, and simulated costs for prospective, concurrent, and retrospective cost analysis for a variety of interventions targeting children and youth across multiple sectors. It includes functionalities such as currency conversions and provides outputs such as automatic data visualizations of aggregated data and disaggregated data downloadable in CSV format. The disaggregated data are stored on a secure server only accessible to the individual conducting the data entry. As can be seen in Figure 1, the process for engaging with C3 is simple. Optional steps include the establishment of a group of enabling stakeholders to engage in the costing process and more detailed analysis of the disaggregated data.

Figure 1. Step-by-step costing exercise with C3



As programs undertake costing exercises with C3, an interactive, searchable database of aggregated cost data will be populated (upon consent of the team undertaking the costing exercise). This database, the Cost Data Explorer, will increase global cost data transparency, allowing stakeholders to compare, consider, and understand investments across population categories (specifically by marginalized groups), intervention types, sectors, and geography.

Table 2. Questions the tool can answer

?	What resources are needed to deliver an intervention?
?	Is the project feasible within a given budget?
?	What are the cost implications of a programmatic change, such as in dosage?
?	What would be the cost of scaling up a program or intervention?
?	How do the costs of intervention A compare to those of intervention B?
?	What are the cost drivers of this intervention?
?	What is the cost per beneficiary of an intervention or program?
?	How are costs distributed across cost categories for this intervention or program?
?	How are the costs distributed across resource categories for this intervention or program?
?	How are the costs distributed between one-time costs and recurring costs?

Source: Author adaptation from multiple sources including Walls et al., 2021 and Levin and McEwan, 2001.

Additionally, C3 can contribute to answering further questions such as a comparison of the costs of an intervention to the monetary value of all the benefits created by this intervention, or a cost-benefit analysis. The cost data that are produced by the tool can also be used in a cost-effectiveness analysis in conjunction with impact data to examine the cost of the intervention per outcome delivered. These data can also be used to examine how the cost per outcome compares to other interventions that produce the same outcome. These types of analysis can be used for advocacy and decisionmaking purposes by governments, civil society organizations, implementers.

Table 3. Questions the tool can answer with outcome/benefit data

Cost-Efficiency Analysis	Cost-Benefit Analysis (CBA)	Cost-Effectiveness Analysis (CEA)
What did this intervention cost per output delivered?	How did the costs of this intervention compare to the monetary value of all the benefits created by this intervention?	What did this intervention cost per outcome delivered?
How does that compare to other interventions to produce this output?		How does that compare to other interventions that produce this outcome?

Source: Author adaptation from multiple sources including Walls et al., 2021 and Levin and McEwan, 2001

C3 allows users to classify each input cost on several dimensions, including cost categories, resource type, investment versus recurrent costs, and imputed/donated versus paid for costs. These cost classifications, expanded on below, allow for more thorough and specific cost analysis.

Cost classifications and cost categories

Direct costs

Training

Direct delivery

Direct program management

Transfers to individuals/families

Other direct costs

Indirect costs

Program design

Indirect program management

Program evaluation

Other overhead costs

Costs can be broken into two main cost classifications. The first, overhead costs, includes those costs associated with designing, administering, and evaluating a program. These are the costs that indirectly contribute to the intervention, such as, but not limited to, feasibility studies, human resources or procurement personnel, and preparation of evaluation reports and documents. The second category includes direct costs of implementing an intervention. These costs can include, but are not limited to, the training of anyone providing services directly to beneficiaries, intervention supplies or materials, and cash transfers to participants.

Resource types in C3

Labor / Personnel | **Buildings / Land / Infrastructure** | **Materials / Supplies / Equipment** | **Facilities rental** | **Travel / Accommodation / Transportation** | **Other**

To examine how funds are being allocated and spent within the cost categories, each entry in the cost calculator is associated with a resource type. This includes five main resource types, as well as a catch-all category of *other* in case there is a cost that does not fit into the provided resource type categories. These include all labor costs, building/land/infrastructure, materials/supplies/equipment, travel/accommodation/ transportation and facilities rental. Notably, the resource types differentiate between buildings/land/infrastructure that must be built, purchased, or maintained, with costs that must be amortized over an expected lifetime and costs for physical space that is not owned by the program, which comes with rental or service fees. The travel, accommodation, and transportation resource type takes into account vehicle rentals, fuel purchases, tickets, lodging, and even per diems.

Investment versus recurrent costs

In addition to the above cost categories and resource types, each cost can be classified as either an investment (one-time) or recurrent cost. This is an important distinction, especially when considering scaling a program, to better understand which costs will recur and which are fixed. For all investment (one-time) costs, the user will be asked for the lifetime of the resource, in years, so that the costs are amortized.

Imputed (donated) resource costs

To ensure that the cost analysis is an accurate portrayal of all resources needed to implement and sustain a program or intervention, users are highly encouraged to include all donated resources, also known as imputed costs. These donated costs may include, but are not limited to, volunteer time, donated supplies, or space for workshops. Costs for donated resources can be determined by obtaining average prices of resources in the given context and identifying the amount of the resource that is needed or used. These costs are often excluded from cost analysis, however, in some cases it could be important to capture all the costs or the economics costs of replicating a program for future reference and external applicability. The tool gives the option of including or excluding imputed costs in the final calculation.

Pilot costing exercises

Following the technical development of C3 on the Tangerine platform, the team initiated a piloting process in three countries. This process provided multiple benefits. First, it was an opportunity to see the tool in action, as well as continue to refine the calculator to ensure it was working as intended. Second, the piloting process allowed Brookings to learn more about the tool's potential to catalyze policy dialogue and action. Third, where it did catalyze policy dialogue, this benefited the partners and their mission. Fourth, the piloting process improved capacity on costing and cost analysis among the organizations and individuals involved in each of the pilot countries. Finally, the piloting yielded important policy-relevant findings on cost drivers as well as unit and total costs for each of the participating programs. This section describes some of the key learnings and benefits from the cost pilots.

Pilots were carried out starting in June 2021 over a six-to-eight-month period for an ECD intervention in Cambodia and for a teacher professional development program in both Ghana and Honduras (see Table 4). The selection of these projects was both intentional and opportunistic. The Brookings team sought geographic and intervention diversity as well as variation in the types of actors engaged. It was also important that each of the teams had a need and desire to conduct costing for the benefit of their own projects. As such, each program had a unique context including different intended audiences, delivery methods, and expected outcomes. Consequently, each program undertook the costing exercise with different costing questions guiding their experience with the tool.

Table 4. Pilot programs at a glance

	Raising Awareness and Innovative Strategies for ECD (RAISE) in Cambodia	**Adopting and Scaling Teacher Professional Development Approaches in Ghana**	**Adapting and Scaling Teacher Professional Development Approaches in Honduras**
Primary target group	Children 0-3 years old and their caregivers; community actors at the commune/village level	Teachers (KG-B3)	Math teachers (seventh-ninth grade)
Total beneficiaries	3,320	1,500	882
Type of intervention	Home visits, social and behavioral change materials, online app, support groups, community meetings to increase awareness of beneficial, nurturing care	ICT-mediated Teacher Professional Development	ICT-mediated Teacher Professional Development
Dates of program implementation	January 2020-March 2022	June-December 2022	April-June 2022

It is important to note that the collection and analysis of cost data comes with numerous challenges and limitations. While the tool itself helps to address some of these challenges, others extend beyond the scope of the tool. First, collecting accurate cost data in low-resource situations can be difficult. The data may come from a variety of sources including different implementing agencies, various levels of government, and disparate settings. Second, the context of engaging with different stakeholders with varying levels of interest and experience with costing can contribute to challenges in both collecting and analyzing costs. Additionally, it is critical to note that, without accompanying impact data, no conclusions can or should be made about the cost-effectiveness of interventions. It should be kept in mind that the case studies below did not examine the outcomes or benefits of the interventions included in the costing exercise, and, as such, selection of intervention or modality based solely on cost data would not be appropriate. Instead, the costing exercise allowed local partners to explore questions related to resource allocation within the project, budgeting, planning, and scaling.

Raising awareness and innovative strategies for ECD (RAISE) in Cambodia

In the second quarter of 2022, Brookings invited the Raising Awareness and Innovative Strategies for ECD (RAISE) program team, led by Save the Children Cambodia, to participate in a pilot to test C3. The costing process spanned about eight months (from June 2021 to February 2022). It began with the establishment of a costing team comprised of relevant stakeholders including local authorities, as well as different departments in Save the Children Cambodia such as monitoring and evaluation, finance, and project management. The costing team saw this costing pilot as an excellent opportunity for the Cambodian government to develop plans informed by costing data thereby supporting an increase in investment in very young children in rural areas. Furthermore, the team identified cost data as critical to the high-quality planning and budgeting required to ensure that target beneficiaries can access needed services, a difficult task when responsibility for early childhood development is spread across 14 separate ministries in the Cambodian government. They also expected that the results from the costing pilot would contribute to learnings for a broader set of stakeholders, including service providers or other non-government entities to use in implementation and research in the future.

The team was especially interested in answering the following questions:

- What resources are needed to deliver the RAISE project if delivered solely by the government?
- What are the main cost drivers?
- Is this project feasible within the given budget?
- What would be the cost of scaling up the RAISE project?
- How are costs distributed between investment costs and recurrent costs? Across resource types?

After establishing the key costing questions, the costing team members were trained on the C3 costing tool. Regular check-ins were held with Brookings to address data or tool challenges. The costing process focused on costs associated with the implementation of the RAISE project. The costing team worked to identify data from project financial reports and to classify the data along cost categories and resource lines established in the C3 tool. Due to the complexity and multisectoral nature of the program, identifying the data proved somewhat challenging. Several iterations ensured that all cost data were entered correctly. Closer engagement between Save the Children and local authorities during the costing process would likely have benefited the end goal of future government engagement. The cost input process was followed by feedback sessions with the Brookings team to discuss the findings and prepare for dissemination of the research.

Box 1. Country background: Cambodia

Cambodia has made exceptional economic progress in the last twenty-five years, reaching lower-middle income status in 2015 and less than one-fifth of the population living in poverty by 2019 (World Bank, 2022; Karamba et al., 2022). With economic growth has come improvements in the education system. The nation has nearly reached universal enrollment in primary education (97 percent) and in 2021 earmarked a colossal 18 percent of the national budget to the education sector. Despite progress, issues remain, with the vast majority of 15-year-olds in the nation below minimum proficiency in literacy and numeracy (USAID, n.d.). Wealth disparities exist across the education spectrum, with the poorest students more likely to be out of school, less likely to transition to secondary school, and significantly less likely to attend higher education (WIDE Education Inequalities, n.d.). Early childhood care and development, spread across multiple agencies and ministries in Cambodia, also faces major hurdles. More than two-fifths (44 percent) of all Cambodian children under the age of five are living in extreme poverty or stunted, and less than one-third of children between six and 24 months received a minimally acceptable diet in 2020 and 2021 (Advancing Nutrition, 2021; UNICEF et al., 2022). Less than half of children aged three to five attend early childhood education, with preprimary gross enrollment rates (34 percent) significantly below the average for all lower-middle income countries (58 percent) (UNICEF Cambodia, 2019; World Bank, n.d.). These factors have a considerable impact on the country, with the World Bank reporting that a child born in 2020 in Cambodia would be less than half as productive as they possibly could be due to deficits in nutrition, health, and education during their childhood (World Bank, 2022).

Intervention description

RAISE was a pilot project implemented by Save the Children Cambodia to improve both awareness and positive behaviors around holistic ECD in Cambodia. RAISE began in January 2020 aiming to create an ideal environment for children at the start of their lives: safe, nurturing, and fostering learning and development from the start.

Behind the RAISE project were years of best practices and research that influenced the innovative strategies used. The project combined person-to-person, home-based interventions with community-based activities that engaged actors in both formal and informal roles to become agents of change in integrated ECD. As part of Save the Children International's Building Brains common approach, the RAISE project focused on improving caregivers' competence in providing high-quality, nurturing care to children aged 0-3 years.

Many Cambodian caregivers and community actors have insufficient knowledge of beneficial early childhood care and development practices, an underlying issue that the RAISE project addressed. At the same time, the project also aimed to increase male engagement in childcare and develop a more comprehensive approach to ECD for very young children. To achieve these goals, the project included

multiple components. Save the Children Cambodia produced and distributed informative social and behavior change (SBC) materials throughout the project's targeted area, including posters and audiovisual messages. In addition, the project made use of modern communications strategies employing digital technologies including an online app for caregivers and digital tracking tools, as well as user journey case studies. The project also supported the development of materials for the Koan Chlaat app and tested the effectiveness of both traditional and innovative (or underutilized) information distribution methods in the community in raising awareness of project messages. Further project activities included detailing and disseminating essential information and best practices regarding effective ECD, including strategies to increase male and grandparent caregivers' engagement with their young children's development.

While there were many activities, all were undertaken with the intention of building integrated ECD capacity in caregivers and community actors. Direct interventions such as home visits, male caregiver support groups, community meetings, and other activities were reinforced through indirect interventions such as mass communications with key project messages regarding child development for children ages 0-3 years. RAISE expended significant effort in the first year to raise awareness of beneficial, nurturing care throughout the community, and then used this basis to build off in the second year to affect lasting changes in knowledge, attitudes, and behaviors. Please see Table A2 in the appendix for more program information.

Cost summary and analysis

The cost analysis showed that the estimated cost of implementing the two-year RAISE program would be $767,000 if the government were to take on implementation on their own (without engagement of Save the Children staff). Given these assumptions and considering 1,576 child beneficiaries in the Kampong Cham province, total costs per child for this intervention were estimated at $199.8. This includes the costs related to capacity building; caregiver sessions; home visits; SBC communications materials development, production, and distribution; and other administrative costs.

As seen in Figure 2, three-quarters (75.4 percent) of the costs in the RAISE project come from direct costs, while overhead makes up just 24.6 percent of project costs. These findings illustrate that the actual provision of the program to beneficiaries makes up a significant amount of costs incurred in the RAISE project.

Figure 2. Distribution of costs by cost classification

Costs are spread over multiple cost categories, with no single category making up a single majority of the costs, as shown in Figure 3. Direct delivery is the biggest cost driver at 42.5 percent, while program evaluation (19.7 percent) and training (18 percent) together account for over one-third of costs. Less significant cost drivers include transfers to individuals/families (8.05 percent), direct program management (5.78 percent), indirect program management (4.19 percent), other unspecified direct (1.05 percent) and overhead (0.762 percent), accounting all together for less than 20 percent of total costs.

Figure 3. Distribution of costs by cost category

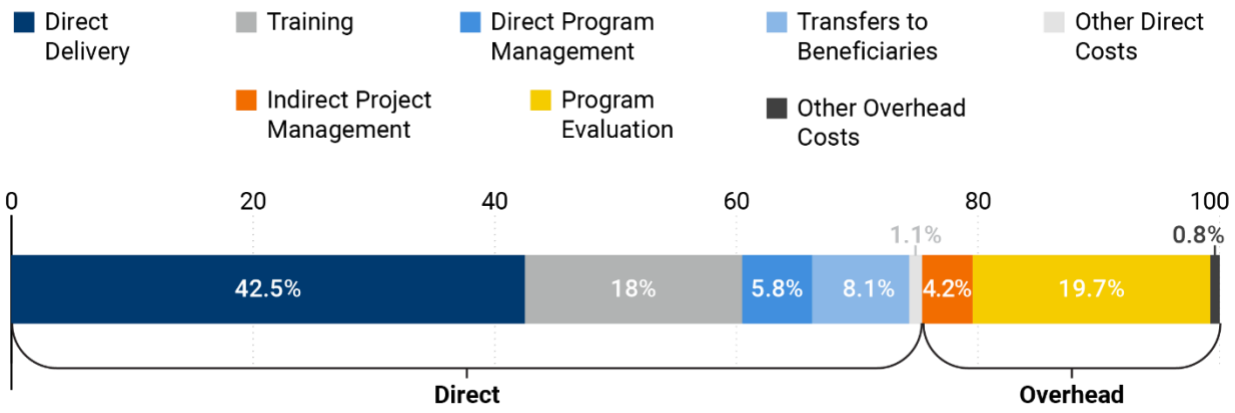


Figure 4 lays out expenditures by resource type, showing that over two-thirds of costs come from just two types: labor/personnel (38.7 percent) and travel, accommodation, and transportation (36.6 percent). Additional costs come from material/supplies/equipment (14 percent), unspecified other costs (5.78 percent), and facilities costs such as rental and service fees (4.95 percent). These findings indicate that future scaling of the program beyond the single province included in the pilot may incur significant costs, as travel, accommodation, and transport as well as facilities costs alone make up over two-fifths of all costs, all of which would likely increase in an expansion. As the project is multisectoral, subnational human resources are critical for capacity development and direct delivery.

Figure 4. Distribution of costs by resource type

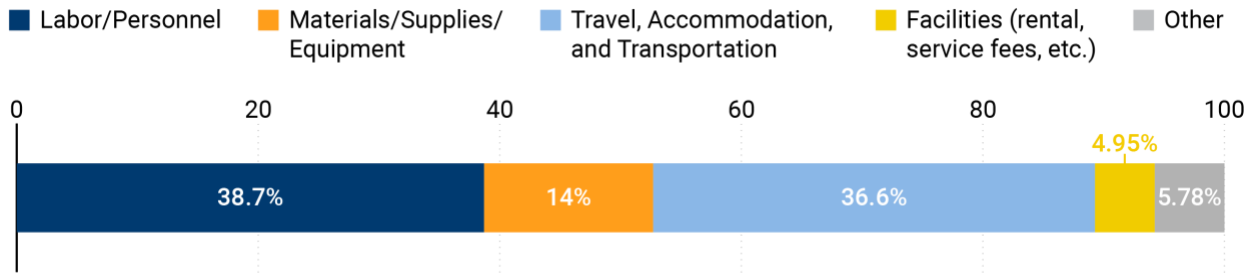
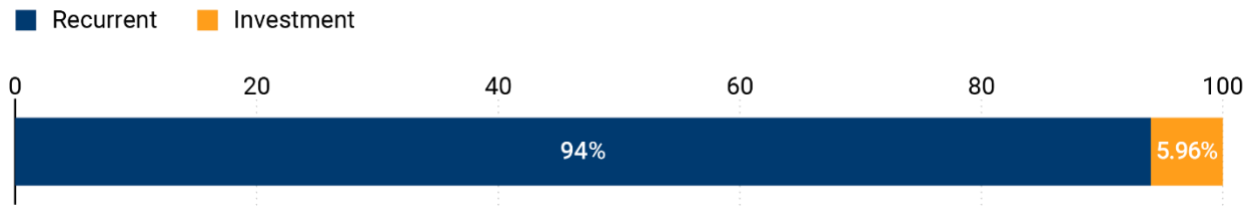


Figure 5 reveals that nearly all costs are recurrent (94 percent), with 5.96 percent of costs being investment. Should this program continue or expand, the budget would be expected to escalate significantly as most costs would need to be replicated.

Figure 5. Distribution of costs by recurrent/investment type



Key cost takeaways:

- Just over three-quarters of costs are direct costs, indicating that the cost of developing the program was significantly less than the actual implementation of the RAISE program for beneficiaries. Should the government take over the provision of RAISE in the future, it can expect to assume the majority of costs.
- Expansion of this program to additional provinces may incur significant costs unless provincial level actors are brought in to run it locally, as a transportation, accommodation and travel make up a considerable amount of spending for the program in just one province.

Conclusions and lessons learned in Cambodia

This pilot highlighted the importance of developing a costing team with members from multiple teams: operations, finance, as well as monitoring and evaluation. The development of a strong core costing team was critical to the success of the exercise, especially in consideration of the COVID-19 pandemic that coincided with the RAISE project and costing process. The pilot also provided an opportunity to consider the costing of a program to scale directly by government rather than the implementing partner (Save the Children Cambodia). This led to important conversations about the inclusion or exclusion of cost categories in the exercise as well as informed plans for dissemination. It was critical to incorporate data from multiple ministries given that early childhood programming includes the input of over a dozen separate ministries in Cambodia.

The results of this costing exercise will be disseminated throughout Cambodia, including with government partners, donor agencies, and NGOs to further the national (and international) conversation on ECD costing. Save the Children Cambodia hopes to serve as a role model for other integrated ECD programming implementors and donor agencies who wish to invest in young children in Cambodia. The data that Save the Children Cambodia has collected will influence their planning and programming and will improve the quality of their budgeting moving forward, enhancing the work they are carrying out on the ground.

Adapting and scaling teacher professional development approaches in Ghana

In the second quarter of 2022, Brookings invited the Ghana Teacher Professional Development at Scale (TPD@Scale) team, led by Worldreader, to participate in the piloting of C3. The Ghana team saw C3 as simple and easy-to-use tool as well as an opportunity to participate in capacity-building and dialogue between Brookings and local Ghanaian officials. For the local team, it was expected that the data generated from the costing exercise would facilitate engagement with government agencies and advocate for equitable, quality TPD models at scale. The data would also help stakeholders at all levels understand the cost drivers behind them. Such cost data would be critical for public policy and data-driven decisionmaking around the scaling of TPD programs. The cost analysis was also seen as an opportunity to support the researchers to begin modelling and costing TPD adaptations at scale. The key questions the project sought to address using the C3 tool included:

- What is the cost per beneficiary of the intervention and between models?
- How are costs distributed across cost categories for the intervention and between models?
- How are the costs distributed across resource types for the intervention and between models?
- How do the overall costs compare across the models?

The costing process in Ghana spanned about six months (from June to December 2022). It began with the establishment of a costing team comprised of relevant stakeholders (National Teachers Council (NTC), Ghana Education Service, University of Ghana, National Council for Curriculum and Assessment, and Teacher Unions) whose mandates include teacher professional development. Costing team members were trained on the C3 costing tool by Brookings, and regular check-ins were held to address data or tool challenges. The costing focused on costs associated with the implementation of the three TPD@scale models in Ghana. The costing team worked to identify data from NTC and Worldreader project data and classify this data along resource lines established in the C3 tool. This created a common vocabulary for costing which facilitated data identification and collection. Data input and analysis was followed up with engagement with the Brookings teams to examine trends found in the data as well as to discuss the costing process with the C3 tool.

Box 2. Country background: Ghana

Ghana is a lower middle-income, multiethnic country in West Africa. Although Ghana has one of the most stable governments in the region, the World Bank estimates that over a quarter of its 31 million people are living in poverty. The average GDP per capita in Ghana ($2,363) is $200 below the average for lower middle-income countries (World Bank, n.d.-a). The nation has made great strides in education, but significant challenges remain. Income inequalities have produced massive disparities in education, with just 9 percent of the poorest students completing upper secondary school while those in the top quintile complete at a rate of over 70 percent (Arthur et al., 2020). The COVID-19 pandemic created a major disruption in the education system, with schools closed for 10 months between March 2020 and January 2021 (World Bank, 2022). In 2021, the Ghanian census revealed that over 1.2 million children ages 4-17 were out of school, with over three-quarters of them having never enrolled at all (Adams, 2023).

Intervention and research study description

The Adapting and Scaling Teacher Professional Development at Scale in Ghana was a two-year research project (2020-2022) seeking to contextualize, customize, test, and continuously improve upon TPD@Scale models in the country. The research sought to understand what adaptations may be needed to promote equitable, quality, and cost-effective TPD at scale. The project is part of the Global Knowledge Innovation Exchange (KIX) global research and was co-led by Worldreader and the National Teaching Council in Ghana and researched by Open University and the University of Ghana. The costing pilot was added to the research to examine the equity, efficiency, and sustainability of the initiative.

The Ghana TPD@Scale piloted two new ICT-mediated TPD models: an online-learning virtual-only mode and a hybrid model which combined online learning with in-person support from district education actors. Both models used ICTs including: 1) a learning management system (LMS) with online and offline course functionality, 2) WhatsApp for communication and community-building, and 3) Zoom to facilitate peer-to-peer learning and online professional learning communities (PLCs). In addition, the hybrid model integrated district level in-person support to teachers and worked proactively to resolve digital literacy or connectivity challenges some more vulnerable teachers may experience such as a lack of familiarity with LMS platforms or WhatsApp, poor or limited internet connectivity, and mobile data costs. Please see Table A3 in the appendix for more program information.

Cost summary and analysis

As noted, data collection and analysis can be complex and must be adapted based on country or project contexts. In the case of TPD@Scale in Ghana, the data collected and analyzed originated from different time periods within the same two-year period, various locations, and different sized training groups. The data for the hybrid model used estimates from Worldreader in three districts with 1500 teachers selected. The virtual-only model used Worldreader project data from 1500 teachers drawn from all of Ghana. Finally, the NTC provided data for a face-to-face cascaded training for 50 teachers which was then modeled for 500 teachers.

A choice was made to conduct the analysis based on 500 teachers (despite there being more teachers across pilots). 500 reflects the total number of teachers that finished the digital-only course. While many more teachers were involved, the decision was made to cost only those teachers that finished the entire course.

In any costing exercise, some assumptions must be made. For instance, the costing team assumed the cost of the LMS platform development to be free (zero cost). Like schools or roads used for face-to-face training and hybrid training, these assets are freely available. However, the cost of maintaining the platform and schools were included as operating costs.

After estimating the total cost of implementing each model, the next level of analysis was to estimate the cost per unit (per teacher trained and per student benefited) for each of the models. Table 5 provides the cost per unit for each of the three models.

Table 5. Costs by delivery model in Ghana

	Total Cost in Cedi*	Total Cost in USD	Cost Per Teacher Trained, USD	Estimated Cost Per Student Benefitted, USD
Virtual Delivery	GH₵ 21,230	$1,698.40	$3.39	$0.02
Face-to-Face Delivery	GH₵ 2,257,156	$180,572.00	$316.15	$3.00
Hybrid Delivery	GH₵ 121,270	$9,701.60	$19.40	$0.12

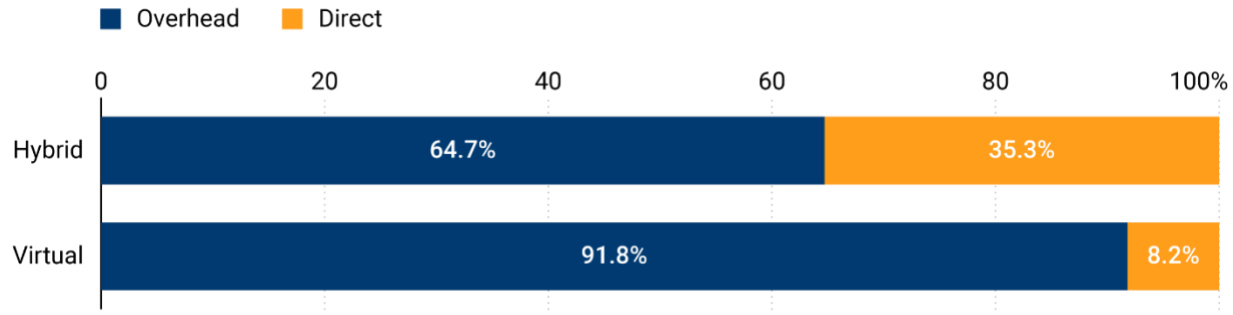
Note: Number of teachers used as base for estimating total cost and unit costs for each model1. Exchange rate 1 USD = GHS 12.5

Overall, the analysis showed that costs were significantly less when comparing TPD mediated by technology to the traditional, face-to-face delivery model. The virtual-only model was the least costly method of TPD delivery, with a per-teacher cost at just $3.39.

When looking specifically at the technology-mediated delivery models, there are major differences in cost drivers. As shown in Figure 6, less than 10 percent of costs in the virtual delivery model were direct costs, suggesting that the vast majority of costs are not related to the actual provision of training, but

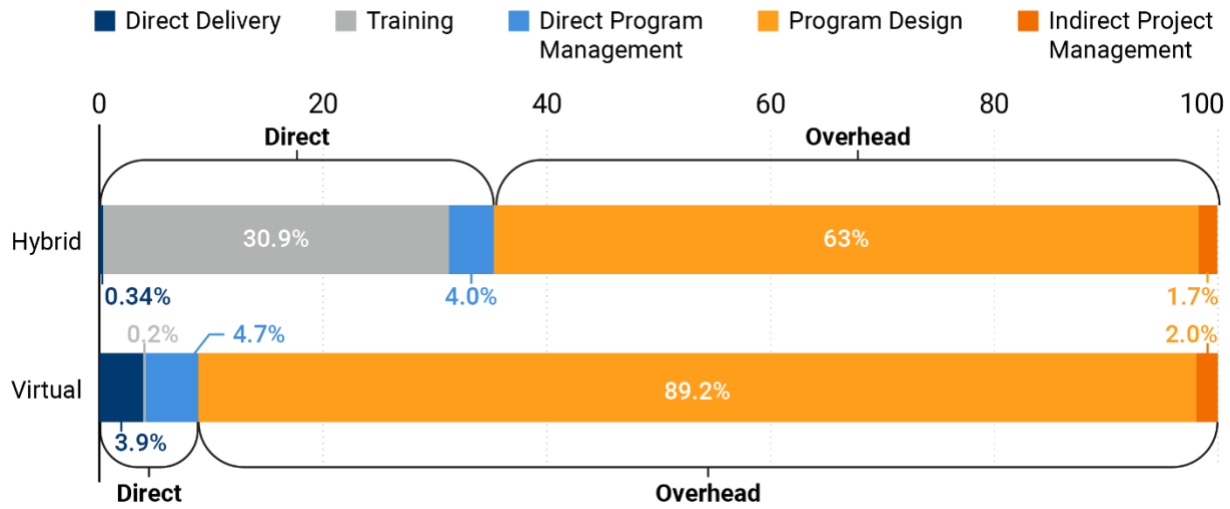
other aspects such as designing, administering, and evaluating the program. On the other hand, the hybrid model, which included in-person support to teachers throughout the TPD shows more significant spending for direct costs.

Figure 6. Distribution of costs by cost classification for hybrid and virtual delivery modality



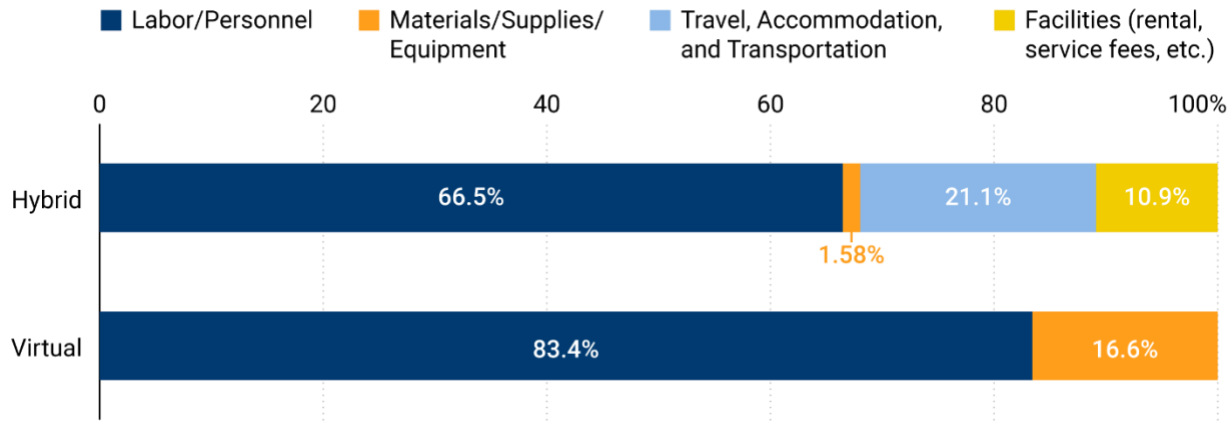
The differences between the two models' cost structures are also apparent when analyzing costs by category. As seen in Figure 7 nearly 90 percent of costs in the virtual delivery model come from program design. This corresponds quite closely to the percentage spent on overhead costs. Direct program management (4.69 percent), direct delivery (3.91 percent), and indirect program management (1.95 percent) together account for just one-tenth of costs. Training costs, coming from training master trainers, accounted for a negligible 0.23 percent of costs. Costs in the hybrid delivery modality come largely from program design (63 percent) and training (30.9 percent), with smaller amounts devoted to direct program management, indirect program management, and direct delivery. In both cases, program design represents the largest cost driver due to the initial cost of hiring a technology expert and instruction design experts to support the building of IT infrastructure and content.

Figure 7. Distribution of costs by cost category for hybrid and virtual delivery modality



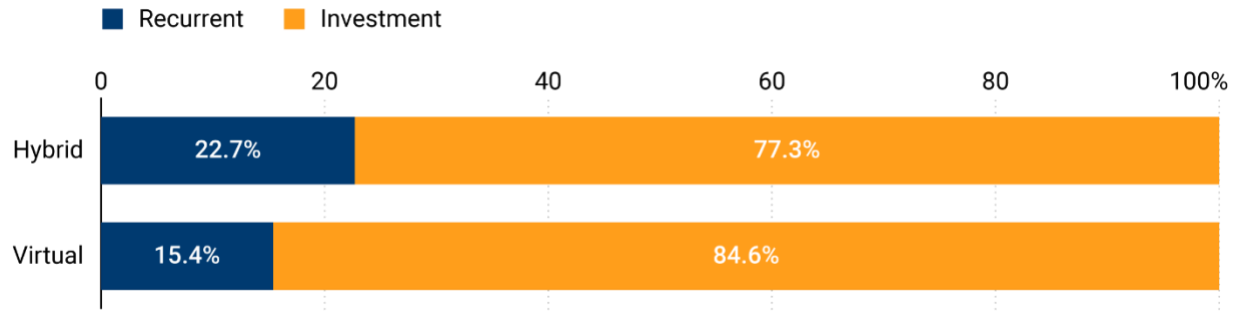
There are also discernible disparities between costs across resource types for each delivery modality. As indicated in Figure 8 the virtual-only model utilized just two resource types. Over four-fifths (83.4 percent) of costs came from labor and personnel, while materials/supplies/equipment accounted for just over 16 percent of costs. This included the telecommunications costs required for a digital program. While labor costs also made up a majority of costs in the hybrid delivery model, they are a less powerful driver, making up just two-thirds of costs. Travel, accommodation, and transportation (of in-person support trainers) and facility rentals and service fees, both of which were not a factor in virtual delivery at all, make up over 30 percent of costs for hybrid delivery. Materials/supplies/equipment are a much smaller proportion of costs in the hybrid delivery model.

Figure 8. Distribution of costs by resource type for hybrid and virtual delivery modality



Determining whether costs are investment or recurrent is critical when considering scaling up a program. Figure 9 shows that almost 85 percent of costs in the virtual-only delivery model are investment costs, with the other 15 percent being recurrent costs. Analysis shows that over 77 percent of costs in the hybrid delivery model are investment, with over 22 percent being recurrent costs. Both models feature high investment costs, signaling that startup costs will be steep, but in the long run, there could be high returns to scaling. Notably, the higher proportion of recurrent costs with the hybrid model indicate that scaling would be more costly than the virtual-only model.

Figure 9. Distribution of costs by recurrent versus investment for hybrid and virtual delivery modality



Key cost takeaways:

- The cost of developing both the virtual and hybrid models is higher than delivering the interventions themselves as shown by the relatively high design costs and the high investment costs relative to recurrent costs (engaging instructional and technology experts as well as other consultants to develop the training framework and content). This indicates that scaling would be relatively inexpensive, in particular for the virtual model.
- Overall, the virtual model is the least costly program followed by the hybrid model, with the traditional model (face-to-face) being the most costly. However, without evaluation data to pair with the cost data, it is not possible to analyze which of the models is most cost-effective.
- Consideration must be given to the Ghana context, where many districts do not have internet or have poor or inadequate network connectivity. Further analysis should be completed to determine if it would be useful to choose a hybrid model that provides district level accommodations for more vulnerable teachers.
- Given the data limitations, for now, going forward, the NTC and GES could benefit from enhancing their collaboration with the District Education Offices in the provision of TPD, through a blend of ICT-mediated TPD and district support for teachers who face challenges such as poor internet access, low ICT skills, etc.

Conclusions and lessons learned in Ghana

Several process lessons were revealed in the Ghana pilot, in particular with respect to timing. Since the costing exercise took place simultaneously with the piloting of the TPD models in the country, it was difficult for the team to set aside time for costing. This resulted in engagement with the University of Ghana to provide support in the costing process. This was perhaps a missed opportunity to further strengthen capacity within government and the implementing partner, but it also opened up an opportunity to engage with civil society.

Overall, the Ghana costing team found the partnership with CUE extremely useful as it provided a basis for further analysis of costing of TPD at all levels of education in Ghana. This was of particular benefit as there have been very few studies on the costing of TPD in Ghana to date. The pilot study provided researchers with the opportunity to develop and generate appropriate data for the diverse types of TPD models. The project also sparked interest in using the C3 tool in the future with the NTC which undertakes many TPD trainings. The tool could be used during internal training, planning, and costing and specifically it would support the analysis of unit costs as well as scaling moving forward.

Based on the insights gained from this experience, Worldreader expects to see improvements in the efficiency of the TPD@scale intervention. Other agencies in the education sector in Ghana who engage in TPD, especially the Ghana Education Service and the National Teaching Council are likely to consider adopting the C3 tool for costing TPD@scale and other interventions.

The cost analysis itself raised important questions about the accessibility of ICT-mediated TPD in a nation where many have poor or limited internet connectivity. In the future, stakeholders plan to continue to explore learnings concerning the costs of delivering TPD@Scale equitably and how these learning can be applied across the education sector in Ghana and the region.

Adapting and scaling teacher professional development approaches in Honduras

In the second quarter of 2022, Brookings invited the Honduras TPD@Scale team led by SUMMA, a research and innovation laboratory in education for Latin America and the Caribbean, to participate in a costing pilot to test C3. The costing process in Honduras spanned about 6 months (from June to December 2022). The initial activity was a mapping of the key actors to be involved in the process of collecting and analyzing costs. These actors included the Ministry of Education, Universidad Pedagógica Nacional Francisco Morazán, and SUMMA, which provided support and technical advice. The team expressed interest in engaging in a costing exercise with the C3 tool because "it presented a valuable opportunity given the high levels of poverty and education sector challenges in Honduras coupled with weak institutionalized policies or practices to analyze cost data." With the implementation of TPD mediated by technology, analyzing costs was fundamental, and participating in the pilot was an opportunity to engage the authorities in using cost evidence to analyze project-level data. Initially, the in-country team identified the main question around costs to be about the adaptability of a TPD@Scale model in the Honduran context. However, during the costing process, many questions arose. Before using the tool, the stakeholder team identified the following questions:

- How, and to what extent, can ICT-mediated TPD@Scale models be implemented in Honduras?
- What financial resources are needed to undertake the initiative?
- Which structures and practices used to deliver TPD mediated by technology are sustainable within the local education system?
- How does the cost of TPD delivered by technology compare to other traditional forms of delivery?
- How can stakeholders be engaged in the costing exercise to assure their support to the TPD unit in the Ministry of Education?

After the stakeholder mapping, two preparation workshops were held. The first workshop centered on establishing country priorities, identifying the core costing team, and introducing the costing process. The second workshop aimed to train the technical team of the Ministry of Education on the use of C3. After the training, the team began collecting cost data and supporting documents. This was followed by data entry by the technical team with guidance from other stakeholders and Brookings. The data entry process involved several iterations while the team and Brookings worked to match the C3 cost categories with the different components of the project. This allowed for improvements on the design of the tool as well as helped to identify some minor technical glitches since Honduras was the first to begin cost entry. Finally, a follow-up workshop was held to analyze the cost data as well as to gather feedback on the costing process with C3.

Intervention and research study description

"Adapting and Scaling Teacher Professional Development Approaches in Honduras" is a research study carried out in collaboration with the Ministry of Education, Universidad Pedagógica Nacional Francisco Morazán, and the support and technical advice of the Laboratory of Research and Innovation in Education for Latin America and the Caribbean, SUMMA. The costing pilot was an additional component that was added to the research as it provided an opportunity to examine the equity, efficiency, and sustainability of the initiative.

Box 3: Country background: Honduras

Honduras, a lower middle-income country in Central America, faces major challenges, with more than 77 percent of the population considered to be living in poverty as of 2021 (Instituto Nacional de Estadísticas, 2022) and, according to the World Bank, one of the poorest countries in Western Hemisphere (Sanchez, 2019). The failing education system is both a result of and contributor to this dire situation. Already reeling from the passage of tropical storms Eta and Iota in late 2020 which damaged more than 530 schools and cost the education sector approximately $33.5 million, the COVID-19 pandemic only worsened the precarious education situation in the country (Banco Interamericano de Desarrollo & Comisión Económica para América Latina y el Caribe, 2021). The country has major disparities in education based on income, with the wealthiest children attending school for 11.1 years, nearly twice as long as the poorest children (5.7) (Orozco & Valdivia, 2017). Compared to other lower middle-income countries, gross secondary school enrollment in Honduras (66 percent) is below average (71 percent) (World Bank, n.d.-b; Education Policy Data Center, 2018). The Honduras 2022 Educational Progress Report revealed that with the additional impact of the pandemic, more than 30 percent of children between the ages of 5 and 17 remain outside of the country's education system (FEREMA, 2022).

Like the Ghana project, this project is also part of the KIX initiative to test, evaluate, and improve the TTPD@Scale[1] model mediated by technology in different teaching contexts. The objective of testing the model in five departments of Honduras was to create a framework and guidelines for enhanced TPD, with a focus on quality, efficiency, and equity. The project promotes the use of evidence and employs improvement cycles in every process of the project. Capacity building within the Ministry of Education and the National Pedagogical University was also an important part of implementation.

There were three main phases of the research: Phase 1, Contextualization of teacher professional development (TPD) in the country; Phase 2, an adaptation of a TPD course following TPD@Scale components that fit into the needs of the country; and, Phase 3, test pilots in two field test phases.

The in-service teacher training system in Honduras is meant to identify and understand the main challenges related to TPD, the characteristics and composition of the teaching workforce, and the institutional capacity existing in country to provide teacher training mediated by information and communication technology (ICT). During the contextualization phase of the project, primary and secondary sources were used to better understand the current situation of in-service training in the country. In the second phase, a draft of a TPD@Scale model for Honduras was developed, and a course for math teachers was designed, considering all the components of the drafted TPD@Scale model. In the third stage of the intervention, two field tests were undertaken. In the first phase of field testing, Field Phase I, 27 teachers and two tutors participated. Field Phase I was conceived as a pilot study that would allow for evaluation of the viability of the model in the context of the Honduran educational system. For the second phase, math teacher specialists and non-specialists from the departments of Atlántida, Cortés, Francisco Morazán, La Paz, and Santa Bárbara were invited, with a total of 882 teachers enrolled. Please see Table A4 in the appendix for more program information.

Cost summary and analysis

In Honduras, the cost analysis was based on data from a project which utilized a TPD course designed in-house and delivered virtually by members of the TPD unit. For this modality, the intervention cost $82,687.26, with a cost of $93.75 per teacher trained (see Table 6).

Additionally, a projected cost exercise was also completed for four other types of delivery: a virtual model using a course model procured from an external source outside the Ministry of Education; a face-to-face delivery model in a central location, a face-to-face delivery model on-site in the municipality; and a blended delivery model which combined traditional face-to-face classroom methods (40 percent) with technology-enabled methods (60 percent). The 60-40 percent is only one model of the many possible blended models that could be configured.

Table 6. Costs by delivery model in Honduras

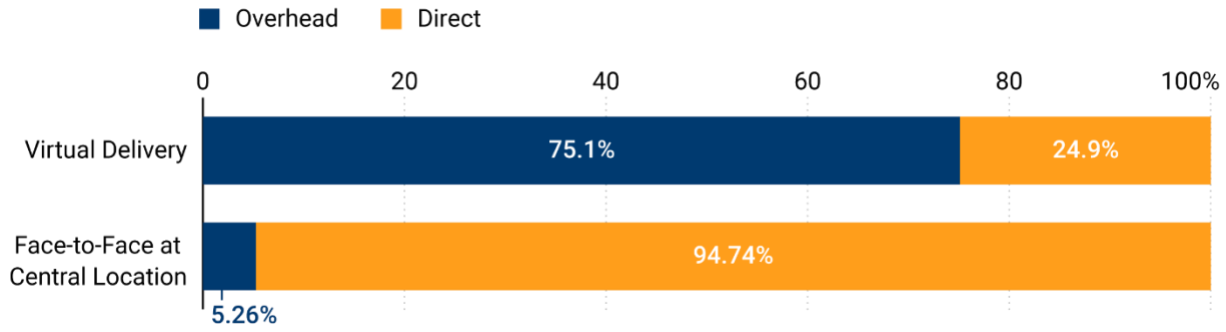
	Total Cost in Lempira*	Total Cost in USD	Cost Per Teacher Trained, USD	Estimated Cost Per Student Benefitted, USD
Virtual Delivery	L. 2,033,676.55	$82,687.26	$93.75	$2.68
Virtual Delivery (using purchase course)	L. 1,313,804.36	$53,417.97	$60.56	$1.73
Face-to-face Delivery at Central Location	L. 10,528,375.60	$428,073.23	$485.34	$13.87
Face-to-Face Delivery at Municipality	L. 3,988,624.93	$162,173.51	$183.87	$5.25
Blended Delivery	L. 3,501,474.25	$142,366.45	$161.41	$4.61

Source: Calculations generated based on project data using the C3 tool. Exchange rate 1 USD = L 24.5948

The cost analysis revealed that a training process mediated by technology has a cost of approximately just 20 percent of the cost of a training process delivered face-to-face, representing substantial cost savings. The least costly option for designing and delivering a training process is using a virtual delivery model where the course is produced by experts in technological course production, and the Ministry of Education only invests in the specialists who determine the course specifications, but not in the production of the course itself.

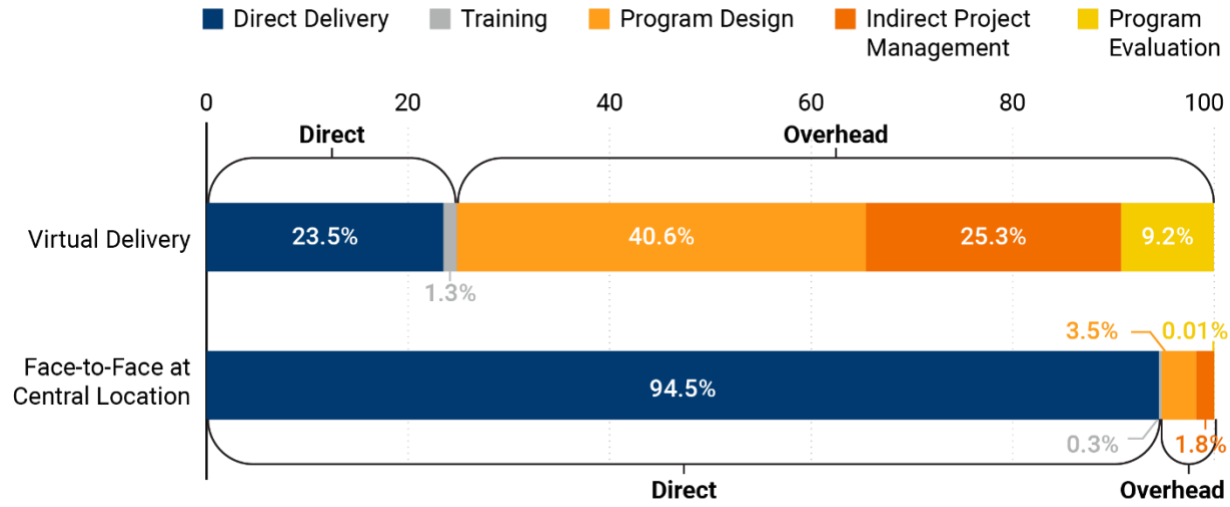
There are significant differences across multiple dimensions when comparing virtual and face-to-face delivery models. As shown in Figure 10, the distribution by direct and overhead costs are equal to 25 percent of and 75 percent respectively. On the other hand, in face-to-face delivery, 95 percent of the cost is direct costs and 5 percent overhead costs. This indicates that the majority of costs in face-to-face delivery are related to the actual provision of providing training to teachers, including required transportation and lodging for teachers to reach the central delivery location.

Figure 10. Distribution of costs by cost classification for virtual and face-to-face at central location delivery modality



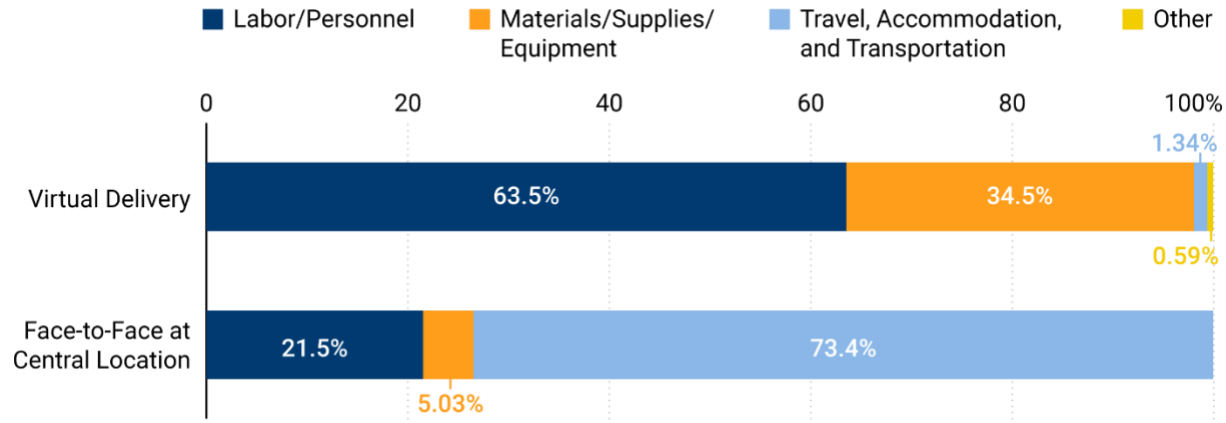
In terms of cost categories, the virtual delivery TPD model had much higher costs related to design, while training costs were comparatively lower. With the virtual delivery model, Figure 11, 40 percent of costs come from project design, with indirect project management (25.3 percent) and direct delivery (23.5 percent) comprising a significant portion of the costs as well. Program evaluation (9.22 percent) and training (1.34 percent) represent the smallest share of costs. Face-to-face training incurs significant expenses for travel and mobility, resulting in much higher direct delivery costs versus design costs.

Figure 11. Distribution of costs by cost category for virtual and face-to-face at central location delivery modality



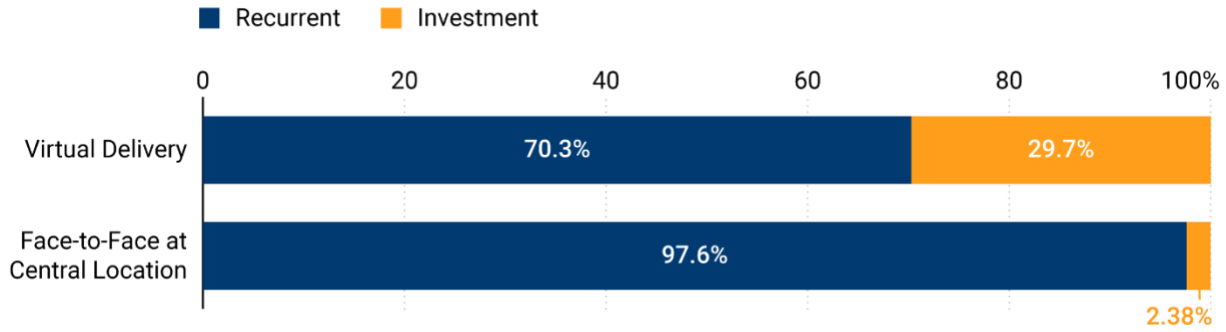
The cost structures concerning resource type are also vastly different in the two delivery methods. As shown in Figure 12, in the virtual delivery model, labor/personnel (63.5 percent) and materials/supplies/equipment (34.5 percent) make up 98 percent of all costs, with all others representing just a fraction of total costs. However, in face-to-face delivery, nearly three-quarters of costs come from travel, accommodation, and transportation.

Figure 12. Distribution of costs by resource type for virtual and face-to-face at central location delivery modality



Another important factor to analyze is if costs are recurrent or one-off or investments costs. As seen in Figure 13, in the virtual delivery model, 70 percent of costs are recurrent and the other 30 percent were investment costs. For face-to-face delivery, a mere 2.38 percent of costs were investment costs with the vast majority of expenses being recurrent. This implies that expenses will escalate significantly with each face-to-face delivery, making it financially challenging to expand the program. The final analysis indicated that a technology-mediated training process scaled up to the total target population would result in a cost of approximately 9 percent of traditional face-to-face training, representing a significant cost savings compared to the conventional method. Nevertheless, without data on the impact of the intervention, it is not possible to determine which is the most cost-effective.

Figure 13. Distribution of costs by recurrent versus investment for virtual and face-to-face at central location delivery modality



Key cost takeaways:

- Using traditional training methods like face-to-face delivery at a central location requires significantly less spending on program design compared to newer methodologies such as virtual delivery.
- The most expensive delivery method is face-to-face delivery at a central location, which requires travel and accommodation for the majority of participants and increases costs significantly. The least costly delivery method is virtual delivery using a purchased course. However, it is not possible to determine which of the models is the most cost-effective without evaluation data for each model.
- The large difference in recurrent costs between the virtual delivery modality (70.3 percent) and face-to-face delivery at a central location (97.6 percent) indicate that scaling a virtual delivery course would be a less costly choice, but again effectiveness data is needed to determine the best model.

Conclusions and lessons learned in Honduras

In Honduras, the use of the tool was especially important because it triggered further action such as the organization of costing teams, collaboration among different units within the Ministry of Education, capacity building, dissemination of information with stakeholders, and a well-structured categorization of the costing data. This included several in-country workshops led by the costing team as well as international presentations about the costing process and findings.

The results of the costing exercise are one important input for the Ministry of Education to make more informed decisions on new and updated policies in Honduras. Specifically, the cost data analysis contributes to the determination of the financial feasibility of the professional teacher training model in the Honduran context. The exercise highlighted the need for impact evaluation data in addition to the cost data to be able to conduct cost-effectiveness analysis of each of the models.

As part of the follow-up to the results of the intervention, SUMMA is generating a policy brief on TPD costing, a document that will be developed with the authorities of the Teacher Professional Development Unit to implement action for an effective TPD in Honduran context. SUMMA, the Ministry of Education, and the Pedagogical University of Honduras will disseminate the results from the pilot costing exercise to all the stakeholders and authorities that support training activities for in-service teachers. The findings are also being shared beyond Honduras. As a KIX project, which aims to promote information mobilization to improve the education systems in partner developing countries, preliminary results have been and will continue to be shared with TPD unit officials across the globe.

Conclusions

As the world faces pressing crises such as war, famine, disease, and climate change that require complex and decisive solutions, it is unacceptable that the majority of children and young people are not receiving the services they need to thrive. Governments, funders, and implementers need improved capacity to advocate for equitable investment, set priorities, budget and plan, manage program activities, improve accountability of spending—all toward the goal of achieving desired child and youth outcomes for all. It is our hope that C3 will play an important role in achieving this vision. With quality cost data from the Childhood Cost Calculator and ideally rigorous impact evaluation data in hand, we expect stakeholders globally will be empowered to make informed financial decisions that will have a positive impact on individuals, their communities, and the economy at large.

The piloting of the tool represents the beginning of this positive trajectory. In Cambodia, Save the Children piloted C3 by costing the RAISE program which sought to improve recognition and positive behaviors around holistic early childhood development in the Kampong Cham province. For Brookings and Save the Children, this pilot provided an opportunity to consider the costing of a program with the goal of scaling directly by government rather than the implementing partner (Save the Children Cambodia). This led to important conversations about the inclusion or exclusion of cost categories in the exercise. Furthermore, the pilot highlighted the importance of developing a costing team with members from finance and data departments across the organization given the multisectoral nature of the program. Based on their positive experience using the tool and the beneficial data resulting from the pilot, the team plans to disseminate their findings throughout the country with government partners, donor agencies, and NGOs.

In Ghana, costing the TPD@Scale project also resulted in a variety of benefits and learning opportunities. For this pilot, the timing of the costing was both a challenge and an opportunity. Because the costing engagement took place simultaneously with the piloting of the TPD models in the country, it was difficult for the team to set aside time for costing. This resulted in engagement with the University of Ghana to provide support in the costing process. This was positive in that it brought in stakeholders from civil society to engage with the intervention, but it was also a missed opportunity to fully strengthen capacity within government and the implementing partner. The cost analysis itself raised important questions about the accessibility of ICT-mediated TPD in a nation where many have poor or limited internet connectivity. In the future, stakeholders plan to continue to explore learnings with respect to the costs of delivering TPD@Scale equitably and how these learning can be applied across the education sector in Ghana and the region.

The final costing pilot, in Honduras, demonstrated that the tool can indeed create an opportunity for dialogue within and across stakeholder groups. This was demonstrated by the number of in-country workshops led by the costing team as well as international presentations about the costing process and findings. As part of the follow-up to the results of the intervention, SUMMA is generating a policy brief on TPD costing, a document that will be developed with the authorities of the Teacher Professional Development Unit to implement action for an effective TPD in Honduran context. SUMMA, the Ministry of Education, and the Pedagogical University of Honduras will disseminate the results from the pilot

costing exercise to all the stakeholders and authorities that support training activities for in-service teachers. The findings are also being shared beyond Honduras with GPE KIX project partners.

In addition to learnings about the costing process and the programmatic findings that the piloting revealed, these exercises also allowed the team at Brookings to learn more about how well C3 works in real-world context and make needed improvements to ensure it was straightforward to use and working as intended. Feedback from the piloting process, for instance, suggested a wider array of intervention types was required which were incorporated during an update to the application. The final presentation of data was also adjusted to provide more useful information up front with the inclusion of both average cost per year and cost per year calculations for programs. The piloting experience also allowed users to encounter small technical glitches that could only be found through active use, allowing the research team and the application designers to tease out the underlying mechanism and fix them. Piloting proved to be an invaluable chance to make certain that C3 would meet the goals behind its development: a user-friendly tool that is accessible to all, does not require technical expertise to employ, and widely applicable to interventions across the child- and youth-centered domains.

Looking forward, bringing cost data to the forefront of country strategies and program implementation and evaluation will require the cooperation and contributions of many. At Brookings, by focusing our efforts on building knowledge bases and strengthening local capacity to handle costing, we, in partnership with and alongside many others, will continue to contribute to a global movement that prioritizes high quality cost data to support equitable and effective financing of programs for children and youth. Given its ease of use, we expect a scaling of C3 across the globe that will generate important public goods. On the one hand, data from the use of the tool will populate the public Cost Data Explorer database. This will include data on the costs of delivering services in an array of contexts and for varying populations, as needs and resources may differ. With this information at hand, it is our aim that adequate funding can be properly allocated to marginalized populations. Simultaneously, communities of tool practitioners will allow for experiences and expertise to be shared widely across geographies and sectors. Tapping into local universities and think tanks, in partnership with governments and implementing organizations, will support our goal to that these efforts be sustainable. Additionally, through a continued partnership with the ECD Action Network (ECDAN), with whom we established the Global Education and ECD Costing Consortium (GEECC) bringing together multilateral and bilateral organizations, funders, implementers and academics, we plan to continue share and generate costing resources for the ECD and education sectors. With all of these efforts, we hope that in the future, costing and quality cost data will become the norm rather than the exception.

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Appendix

Table A1. Selected additional costing tools and guidance documents

Title	From	Type	Sector	Notes
Cost Measurement Guidance Note	Building Evidence in Education (BE2) (supported by UNICEF, the World Bank, USAID, FCDO)	Guidance document	Education	General guidance to improve effectiveness of investments among funders and national governments; open access PDF
Guidelines for Benefit-Cost Analysis	Harvard T.H. Chan School of Public Health	Guidance Document/ Reference Case	Health	Guidelines for conducting benefit-cost analyses that are high quality and comparable, including a reference case; open access PDF
Reference Case for Estimating the Costs of Global Health Services and Interventions	Global Health Cost Consortium (GHCC)	Reference Case	Health	Guide for improving quality of cost estimates through disseminating process and best practices; open access Word document
EiE Cost Capture Template	U.N. Girls' Education Initiative (UNGEI)	Excel-based, micro-costing template	Education in Emergencies	Education-specific, gender-responsive cost tracking for emergency interventions; open access download
USAID Education Cost Analysis Guidance and Template	USAID	Overall micro-costing approach, Excel-based template, guidance document	Education	Common approach and framework for USAID-funded education interventions; open access download
J-PAL Costing Templates and Guidelines	J-PAL	Excel-based micro-costing template	Education	Detailed and basic costing templates excluding evaluation costs; open access download
Dioptra	International Rescue Committee (IRC)	Web-based micro-costing tool	Humanitarian and development	Uses existing accounting information and automatic pulls of expense data for costing and cost-efficiency analysis; only available to members of the Systematic Cost Analysis

				Consortium, requiring annual payment
ILO Care Policy Investment Simulator	International Labor Organization (ILO)	Web-based macro-simulation	Early childhood development	Simulates and calculates investment requirements for four care policy areas: child care-related paid leave, paid breastfeeding breaks, early childhood care and education, and long-term care services; open access after free registration
UNICEF ECE Accelerator Simulation Model	UNICEF	Excel-based macro-simulation	Early childhood education	Detailed projection of resources needed to meet country targets for provision of early childhood education; open access to download
UNESCO Simulation for Education (SimuED)	UNESCO	Excel-based macro-simulation	Education	Projection of selected SDG 4 indicators for national planning exercises; open access to download

Source: Author adapted from Girma, 2023 with the addition of Robinson et al., 2019 and Vassall et al., 2017

Table A2. Cambodia project details

Name of project	Raising Awareness and Innovative Strategies for ECD (RAISE)
Country	Cambodia
Region(s)	Kampong Cham province
Primary delivery region category	Asia Pacific
Primary target group	Children 0-3, caregivers, and community actors at the commune and village level
Total beneficiaries	3,320 1,040 children aged 0-3 2,080 caregivers 200 community actors
Type of intervention	Pilot project within existing mechanism of government
Location(s) of intervention	Kampong Cham province, Cambodia
Duration of overall intervention per beneficiary (from first interaction to end of activities)	2 years
Frequency of activities	2 times
Dosage of activities (duration of each interaction with beneficiary)	1 to 1.5 hours
Direct delivery personnel minimum level of education	Lower secondary school
Child-to-delivery personnel ratio	15:1
Implementing agent	Save the Children Cambodia
Implementing agency category	NGO
Current program funders	Save the Children Hong Kong
Primary current program funder category	NGO
Out-of-pocket fees for participation	$20,000 from Community contribution
Dates of program implementation	January 2020 – March 2022
Unit cost per beneficiary (2022 U.S. $)	

Table A3. Ghana project details

Name of project	Adapting and Scaling TPD Approaches in Ghana
Country	Ghana
Region(s)	16 regions of Ghana
Primary target group	Teachers (KG – B3)
Total beneficiaries	1500 teachers 22,100 pupils
Type of intervention	ICT mediated Teacher Professional Development (TPD) model testing
Location(s) of intervention	Online, Schools and Districts
Duration of overall intervention per beneficiary (from first interaction to end of activities)	6 weeks
Frequency of activities	5 times per week
Dosage of activities (duration of each interaction with beneficiary)	1 hour
Direct delivery personnel minimum level of education	Tertiary education level for course master trainers and district education personnel
Implementing agent	Worldreader, National Teaching Council, University of Ghana and Ghana Education Service
Implementing agency category	Government, NGO, academic institution
Current program funders	GPE-KIX
Primary current program funder category	Multilateral donor
Out-of-pocket fees for participation	Data costs for trainers and teachers
Dates of program implementation	June –December 2022
Unit cost per beneficiary (2022 U.S. $)	$19.40 to train a beneficiary (hybrid model) $3.39 to train a beneficiary (virtual-only model)
	$0.12 per child benefited by having a trained teacher (estimated, hybrid model) $0.02 per child benefited by having a trained teacher (estimated, virtual-only model)

Table A4. Honduras project details

Name of project	Adaptation and Scaling Up of Teacher Professional Development Approaches in Honduras (2020-2022)
Country	Honduras
Region(s)	Atlántida, Cortés, Francisco Morazán, La Paz, and Santa Bárbara
Primary target group	Math teachers for seventh to ninth grade (third cycle)
Total beneficiaries	882 teachers 150,000 children (estimated) over 5 years
Type of intervention	Teacher Professional Development, TPD Training delivery mediated by technology
Location(s) of intervention	Online, serving 5 departments of the country
Duration of overall intervention per beneficiary (from the first interaction to the end of activities)	Approximately three months
Frequency of activities	5 times per week
Dosage of activities (duration of each interaction with beneficiary)	One hour
Direct delivery personnel minimum level of education	Teachers with a math education specialization
Implementing agent	Ministry of Education, TPD Unit (DGDP)
Implementing agency category	Government
Current program funders	GPE/KIX
Primary current program funder category	Multilateral/bilateral
Out-of-pocket fees for participation	None
Dates of program implementation	April 2022 - June 2022
Unit cost (2022 U.S. $)	$93.75 per teacher trained $2.68 per child benefited by having a trained teacher (estimated)