

**The Effectiveness of Education Interventions in Developing Countries:
A Literature Review for Christian NGOs**

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Abstract

Official aid programs and NGOs provide extensive funding for education in developing countries. Yet, implementing successful education interventions is difficult, due in part to inadequate evidence on which interventions are effective. We review the literature that evaluates education interventions in developing countries to provide Christian (and other) NGOs information on the relative effectiveness of those interventions, and on how to increase their effectiveness. We consider nine types of education interventions of most interest to Christian NGOs, as determined by a survey of those NGOs. Interventions that improve pedagogy and instruction are more effective than providing material inputs. This suggests that Christian NGOs working in developing countries should focus on training teachers, other school staff, and even parents, to provide high-quality academic, socio-emotional, and vocational education. When material inputs are required for training teachers, school staff, and parents, they should be supplied, but material inputs alone are unlikely to be effective.

Keywords: Education, developing countries, Christian NGOs, intervention effectiveness, literature review.

Resumen

Los programas oficiales de ayuda y las ONG proporcionan una amplia financiación para la educación en los países en desarrollo. Sin embargo, implementar intervenciones educativas exitosas es difícil, debido en parte a la evidencia insuficiente sobre qué intervenciones son efectivas. Revisamos la literatura que evalúa las intervenciones educativas en países en desarrollo para proporcionar a las ONG cristianas (y otras) información sobre la efectividad relativa de dichas intervenciones y cómo aumentarla. Consideramos nueve tipos de intervenciones educativas de mayor interés para las ONG cristianas, según lo determinado por una encuesta realizada a dichas ONG. Las intervenciones que mejoran la pedagogía y la instrucción son más efectivas que proporcionar insumos materiales. Esto sugiere que las ONG cristianas que trabajan en países en desarrollo deberían centrarse en la capacitación de docentes, personal escolar e incluso padres, para brindar una educación académica, socioemocional y vocacional de alta calidad. Cuando se requieren insumos materiales para la capacitación de docentes, personal escolar y padres, estos deben proporcionarse, pero es poco probable que los insumos materiales por sí solos sean efectivos.

Resumo

Os programas oficiais de assistência e as ONGs fornecem financiamento substancial para a educação em países em desenvolvimento. Contudo, a implementação de intervenções educacionais bem-sucedidas é desafiadora, devido em parte à evidência inadequada sobre quais intervenções são eficazes. Realizamos uma revisão da literatura que avalia intervenções educacionais em países em desenvolvimento para fornecer às ONGs cristãs (e outras) informações sobre a eficácia relativa dessas intervenções e sobre como aumentar sua efetividade. Consideramos nove tipos de intervenções educacionais de maior interesse para ONGs cristãs, conforme determinado por um levantamento junto a essas organizações. As intervenções que aprimoram a pedagogia e a instrução são mais eficazes do que o fornecimento de insumos materiais. Isso sugere que as ONGs cristãs atuantes em países em desenvolvimento devem concentrar-se na capacitação de professores, demais funcionários escolares e até mesmo pais, para prover educação acadêmica, socio-emocional e profissional de alta qualidade. Quando insumos materiais são necessários para a capacitação de professores, funcionários escolares e pais, eles devem ser fornecidos, porém os insumos materiais isoladamente apresentam baixa probabilidade de serem eficazes.

I. Introduction

In almost all societies, education is a fundamental requirement for a high quality of life. Education is valuable not only for its intrinsic benefits, such as the ability to read, but it also leads to other benefits, such as higher incomes and better health. Article 26 of the United Nations Universal Declaration of Human Rights states that “Everyone has a right to education”. Thus, many secular and faith-based non-governmental organizations (NGOs) support education projects in developing countries. For example, as explained below, more than a third (36/100) of the member organizations in the Accord Network¹ support some form of education intervention in developing countries.

Both official aid programs and NGOs provide very large amounts of funding for education, broadly defined, in developing countries. According to OECD statistics (“OECD Data Explorer,” n.d.), official multilateral and bilateral development organizations provided USD 16.7 billion dollars for education programs in 2023.² NGOs also provide very large amounts. For example, Wydick et al. (2013) estimate that child sponsorship programs, which include education support as a key component, transfer about USD 3.4 billion to support children in developing countries. Another example is Catholic Relief Services, which spent about USD 100 million on education in 2022.³

Yet, as many NGOs know, designing and implementing successful education interventions is not a simple task. Practitioners are faced with challenges such as

¹ The Accord Network is an association of Christian organizations and agencies that work in humanitarian aid and development. More information can be found at <https://accordnetwork.org/>.

² This number is obtained by going to <https://data-explorer.oecd.org/>, then click on “Official Development Assistance (ODA)”. Then scroll down and click on “DAC5: Aid (ODA) by sector and donor”. Finally, click on the “Table” icon near the top of the screen. *Accessed September 9, 2025.*

³ See <https://give.org/charity-reviews/religious/catholic-relief-services-in-baltimore-md-475>. This figure can be seen by clicking on the “Programs” tab near the bottom of the screen.

resource constraints, institutional barriers, and geopolitical issues. Perhaps as challenging is inadequate evidence on which education interventions are effective, and which are ineffective, and how this varies across different contexts. As an illustration of this point, when asked about their research needs, 68% of the Christian NGOs that responded to our survey expressed interest in a review on the effectiveness of different educational programs.

Given their desire to implement more effective education interventions, the goal of this paper is to review the large literature that evaluates these interventions in developing countries to provide information to Christian NGOs on the relative effectiveness of different types of those interventions, as well as how to increase the effectiveness of a given intervention. While this review should be useful to all NGOs, both secular and Christian, we focused on interventions that we found to be of particular interest to Christian NGOs, based on a survey of those NGOs (see below).

We chose to start with a very broad definition of “education”, including all activities taking place in schools as well as educational activities outside of schools, and not only interventions directed toward children but also interventions directed toward adults. This includes, but is not limited to, adult literacy, job/vocational training, education services provided within the context of child sponsorship, writing programs, and designing of reading materials. We later narrow the scope of the paper based on the types of interventions that practitioners demonstrated more interest in.

It is difficult to summarize our findings given the wide variety of education interventions and the wide range of countries in which they have been implemented. Perhaps the most important finding is that interventions that include improvements in pedagogy and

instruction are more effective than providing material inputs alone for promoting positive outcomes for students. This suggests that Christian NGOs working in international education should focus on training teachers and other school staff, and even parents, to provide high-quality academic, socio-emotional, and vocational education. When material inputs are required for training teachers, other school staff, and parents on how best to educate students and children, those inputs should be supplied. In contrast, providing material inputs alone is unlikely to be a wise investment.

The rest of the paper is organized as follows. The next section presents the survey that we implemented of Christian, international development NGOs that work in education, which we used to choose the nine education interventions that seemed to be of the highest interest to these Christian NGOs. Section III then explains the methodology used to review the hundreds, if not thousands, of evaluations of education interventions. Section IV then reviews the findings of evaluations of these nine types of education interventions. The last section summarizes our findings.

II. Survey of Christian NGOs Working in Education

To ensure the relevance of our literature review for Christian development practitioners working in international education, we began by surveying these organizations about the types of interventions that they are implementing, the types of interventions they would like to see reviewed, and the types of evaluations they have already had done on their own programs and initiatives.

Our set of survey respondents was originally drawn from the list of Christian non-governmental organizations (NGOs) that are members of the Accord Network. Six additional organizations were added to the list utilizing our own knowledge of the field and suggestions from other researchers and practitioners. After assembling the list of organizations, we conducted a website review for every organization to identify the sector(s) they work in, the number of countries, and the type(s) of interventions they implement. Any organization not working in education was removed from the set of organizations. For those organizations for which it was ambiguous, we kept them in our set. Points of contact were then identified (via emails listed on the organization's website, LinkedIn, and the contact form on the websites) for each of the organizations remaining in our set. These points of contact were then sent a link to our [Google Form survey](#).⁴ We sent the survey to 49 Christian development organizations, and we received 33 responses (32 of which were from individuals from different organizations) for a 65% response rate. See Appendix 1 for a list of the organizations that participated in our survey.

The organizations in our set were of widely varying sizes, as shown in Table 1. Slightly over one-third (34.4%, 11 out of 32) of the organizations surveyed currently serve 9,999 or fewer children or students, and nearly another one-third (31.3%, 10 out of 32) serve 10,000-49,999 children or students. Just under 10% (3 out of 32) serve 50,000 to 99,999 children or students. And exactly 25% (8 out of 32) of the organizations surveyed currently serve more than 100,000 children or students.

⁴ This is a copy of the original survey. The required questions are no longer marked as required so that all the questions can be seen without completing the survey.

Table 1. Percent of organizations in response set by number of children or students served annually

Number of children or students served	Percent of response set (N = 32)
Less than 1,000	15.6% (5)
1,000 to 4,999	9.4% (3)
5,000 to 9,999	9.4% (3)
10,000 to 49,999	31.3% (10)
50,000 to 99,999	9.4% (3)
100,000 to 499,999	15.6% (5)
500,000 to 999,999	3.1% (1)
1,000,000 to 4,999,999	3.1% (1)
More than 10,000,000	3.1% (1)

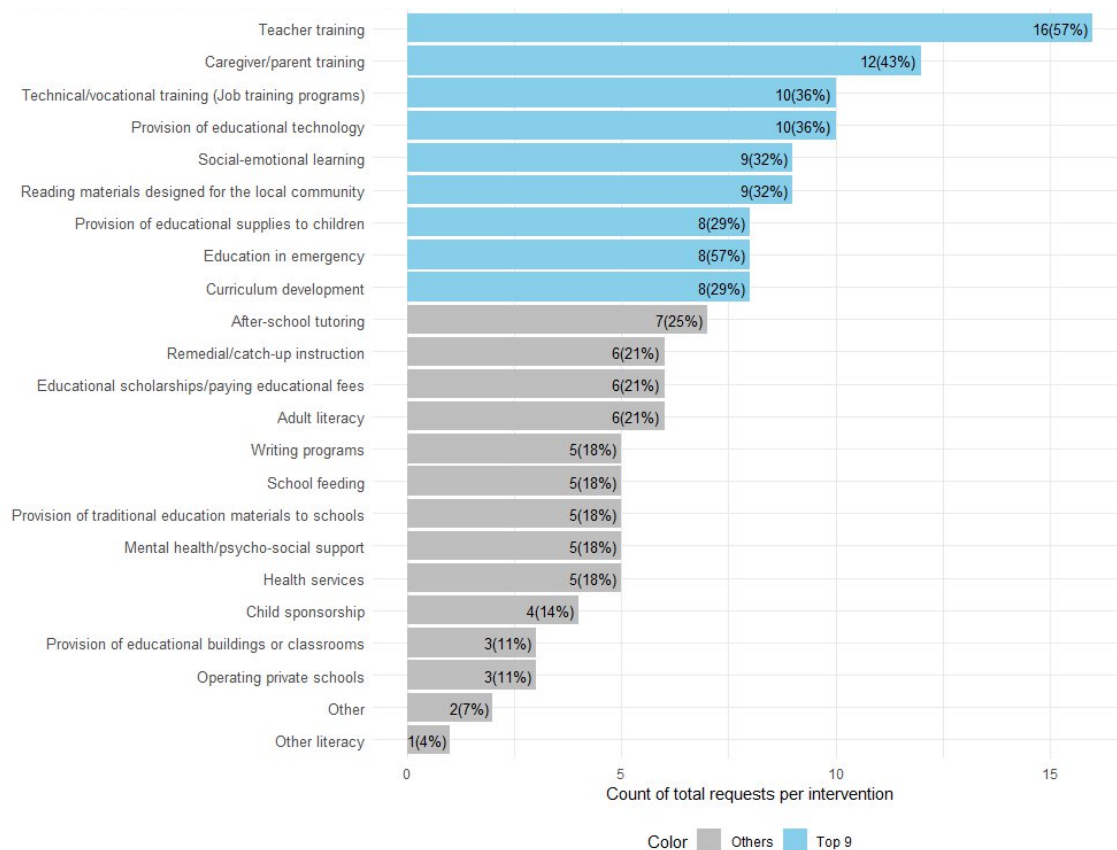
Source: Authors

Note: This table shows the percent of Christian NGOs that responded to our survey by the number of children or students they serve annually.

One of the key questions in our survey of Christian NGOs was: “What kinds of education programs would you like to see reviews of, or would you like to have evaluated?”

The responses received are shown in Figure 1. Of the 23 options, the most common response was teacher training programs, which were cited by about 52% of the Christian NGOs that we surveyed. The next eight, in order of frequency of responses, were: caregiver/parent training, technical/vocational training, provision of education technology, socio-emotional learning, learning materials for the local community, education in emergencies, provision of educational supplies to children (e.g. textbooks), and curriculum development. Given that these were the education programs of most interest, this review focuses on these nine education interventions. Fourteen other, less commonly selected, education programs are also shown in Figure 1. Although our literature review focuses on the nine interventions that attracted the most interest, occasionally, the literature on those nine interventions also touches on some of the other less commonly selected interventions. For example, the section about provision of education supplies to children also considers the provision of traditional education materials to schools, and educational buildings or classrooms, the section about curriculum development also includes remedial/catch-up instruction, and the section about mother tongue instruction considers adult literacy.

Figure 1. Education interventions of most interest to Christian NGOs



Source: Authors

Note: Education practitioners from 32 Christian NGOs indicated the kinds of education programs they would like to see reviews of, or would like to have evaluated.

III. Methodology for Choosing Evaluation Studies

Hundreds of high-quality evaluations of education projects and programs in developing countries have been published in one form or another in the past 10-20 years.

Reviewing each of these studies would have required a great effort, but fortunately many reviews have already been conducted of these studies. However, none of the reviews to date has been conducted from the perspective a Christian NGOs that work on education

in developing countries, so we decided to conduct a review of all of the literature reviews of the impacts of education programs and policies in developing countries conducted from 2013 to 2024, focusing on topics that are of particular interest to Christian NGOs.

While focusing on literature reviews, rather than conducting a new review “from scratch,” reduced the time required to write this paper, it has (at least) two disadvantages. First, we may have missed some very recent studies that have not yet been included in any literature review. Second, a single study can appear in many reviews, which may give a misleading impression that there are many studies on a specific education policy when in fact there are only one or two such studies. We give some examples of this later in this paper, and more generally we clarify when different reviews refer to the same study or same small number of studies.

To find all the literature reviews of the impacts of education programs and policies in developing countries, we started with a list of literature reviews that we were aware of, based on the experience of one of us (Glewwe), who has been an author of several literature reviews. We then asked David Evans (formerly of the World Bank, then later at the Center for Global Development, which includes two years at the Inter-American Development Bank before returning to the Center for Global Development) for more literature reviews that we may have overlooked. He has written several reviews himself, and is very knowledgeable about education, and research on education, in developing countries.

Based on this process, we initially found 29 literature reviews written between 2013 and 2023. Occasionally, when these initial sources did not provide sufficient information about an intervention, we read the original studies or sought out other sources. For each

of the nine topics with the most interest from Christian NGOs, we searched each literature review to see whether it reviewed rigorous evaluations on that topic.⁵ Our search captured both exact matches through traditional keyword search, as well as synonyms and related content through prompts entered in AI tools (such as chatPDF.com). We also inspected tables of contents and visually scanned the documents.

The fact that some topics had been studied by researchers much more than others also affected our ability to present consistent and comparable findings across topics. For example, for some topics we provide more detailed information about the effect sizes of specific interventions, while for other topics we can give only more global summaries about which interventions are effective and which are ineffective. Another example is cost-effectiveness of interventions—most studies did not report this, but in a few cases where it was reported, we do briefly discuss those results.

IV. Findings for Nine Types of Education Interventions

This section provides the findings from the 29 literature reviews for the nine types of education policies that were of most interest to the 32 Christian NGOs that completed our survey. We cover these in order of the interests expressed by those Christian NGOs, starting with the education policy that attracted the most interest, teacher training, and ending with the education policy with the lowest interest (among the nine policies that attracted the highest interest), curriculum development.

⁵ This involved creating a spreadsheet where each row is one of the literature reviews and each column is one of the nine topics. This spreadsheet is described in Appendix 2.

A. Teacher Training

Virtually every developing country spends a large amount of money on teacher training. Almost all the governments of these countries provide two types of teacher training. The first is “pre-service” training, which is a degree program that future teachers must complete to become qualified for regular teaching positions. This is usually done before becoming a teacher. The second is “in-service” training, which are short courses, as little as one day or as much as 3-4 weeks, that serve current teachers as refresher courses or as courses to learn new pedagogical methods or changes in the curriculum (or both). It is estimated that developing country governments spend well over USD 1 billion each year on teacher training (Schaffner et al. 2024), and this figure is almost certainly much lower than the actual amounts spent because, to the best of our knowledge, no one has added up the spending on in-service (or pre-service) for all developing countries.

Almost all the research on teacher training in developing countries focuses on in-service training. This is also the type of training that Christian NGOs are most likely to offer. For the rest of this subsection, “teacher training” refers to in-service training. We also include in this category follow-up activities, such as coaching, done at the teachers’ schools after the in-service training is completed (or as an alternative to in-service training).

Several of the other education programs considered in this paper include at least some teacher training as part of the implementation of those programs. For example, curriculum development and programs that use educational technology often include some training for the teachers to use the new curriculum or new technology. To avoid repetition, this section will focus on teacher training programs that are designed to

increase teachers' general pedagogical skills, as opposed to training teachers to implement a specific type of intervention.

Also, we do not count "teaching at the right level" (TaRL) as (general) teacher training. Rather, we regard TaRL as "targeted instruction," which typically does not emphasize learning new pedagogical methods but instead focuses on matching one of the appropriate existing pedagogical methods to the academic level of some or all of the students.

Of the 32 Christian NGOs that participated in our survey, about 59% (19/32) indicated that they have conducted teacher training programs. In addition, and as seen in Figure 1, teacher training was the topic most frequently cited by Christian NGOs in response to the following question in our survey: "What kinds of education programs would you like to see reviews of, or would you like to have evaluated?" More specifically, about 57% (16/28) of these organizations responded positively to this question, which was the highest percentage among all the different types of education programs (see Figure 1).

Most of the 29 literature reviews that served as the starting point for this paper reviewed one or more studies of teacher training. More specifically, 22 of these reviews included studies of teacher training. The following general findings emerge from these reviews.

The first finding is that "standard" teacher training programs, where teachers travel to a training center to stay for a few days or weeks, attend lectures by trainers on general pedagogical skills, and return to their schools without any follow-up from trainers or coaches, are generally ineffective, in terms of both increasing teacher skills and raising their students' learning. This raises the question of how teacher training can be changed to make it more effective. This is examined in the rest of this subsection.

In general, teacher training programs are more effective at increasing student learning when they provide more active learning activities for the teachers, as opposed to having teachers sitting passively, listening to lectures from trainers. More specific recommendations are:

- a) Trainers should demonstrate to the teachers the teaching methods that they are teaching, as opposed to simply describing those methods in a lecture format (Stern, Jordan, et al. 2023; Stern, Jukes, et al. 2023);
- b) Teachers should have ample time in the teacher training classes to practice the new pedagogical skills that they are being taught, and it is especially helpful for teachers to practice in small groups with other teachers (Popova et al. 2022; Stern, Jordan, et al. 2023; Stern, Jukes, et al. 2023);
- c) Teachers should be provided adequate time to discuss among themselves, and with their trainers, the new skills that they are being taught (Stern, Jordan, et al. 2023; Stern, Jukes, et al. 2023).

Second, teacher training programs are also more effective if they are focused on specific, practical skills, instead of general, abstract skills. This includes focusing on how to implement practical, recommended teaching practices in the classroom, as opposed to teaching abstract concepts (Akyeampong et al. 2023; World Bank 2018). It also implies that training should focus on a particular subject, such as mathematics or reading, rather than general pedagogical training (Popova et al. 2022; World Bank 2018).

A third recommendation is that teacher training programs should not end after the training is over. Instead, they should provide follow-up support in terms of visits by the trainers or visits by coaches. This follow-up should involve providing feedback for improving teachers' skills, as opposed to only evaluating whether the teachers are correctly implementing what they have learned in the classroom (Akyeampong et al. 2023; Angrist et al. 2025; Bashir et al. 2018; Conn 2017; Evans and Mendez Acosta 2021; Glewwe et al. 2020; 2022; Popova et al. 2022; Stern, Jordan, et al. 2023; Stern, Jukes, et al. 2023; World Bank 2018). Consistent with this approach, visits by trainers and coaches should be friendly, as opposed to being judgmental or investigative (Stern, Jukes, et al. 2023).

The fourth recommendation, which has received widespread support, is that teacher training programs should provide teachers with detailed lesson plans (including scripted lessons). This finding was emphasized in almost all the literature reviews (Akyeampong et al. 2023; Angrist et al. 2025; Bashir et al. 2018; Evans and Mendez Acosta 2021; Evans and Yuan 2022; Ganimian and Murnane 2016; Glewwe et al. 2020; 2022; Popova et al. 2022; Stern, Jordan, et al. 2023; Stern, Jukes, et al. 2023; World Bank 2018).

A fifth set of recommendations concerns which teachers should participate in training, and the role of teachers in determining what is taught in the training. One finding of this type is that some teachers have deficient skills in the subjects that they teach, and so for these teachers some of the time in the training needs to be set aside time to increase teachers' understanding of what they are teaching, for example more advanced math skills (Stern, Jordan, et al. 2023). Another result is that teacher training should be targeted to less experienced teachers (Popova et al. 2022). Lastly, trainers should

interact with individual teachers, and ask them what they would like to be covered in the current, as well as future, training sessions (Popova et al. 2022; Stern, Jukes, et al. 2023).

A final recommendation is that Ministries of Education should have a system in place that rewards teachers for participating in teacher training sessions. This could take many forms, including having increases in teachers' salaries and increased probabilities of promotion after successfully completing a teacher training program (Popova et al. 2022).

There was also disagreement or ambiguity on some policies. For example, some reviews advise that teacher training should be conducted "face-to-face," as opposed to remote/online/distance training (Popova et al. 2022; Stern, Jordan, et al. 2023; Stern, Jukes, et al. 2023). Yet one review found studies showing that online coaching was effective in South Africa, suggesting that it can be effective in at least some settings (Rodriguez-Segura 2022).

Another area of disagreement was on the length of the training courses. One review found that, in one study, trainers were of the opinion that more days of training were needed (Stern, Jukes, et al. 2023). On the other hand, sometimes teachers think that the training programs are too long (Popova et al. 2022).

There are two findings that some practitioners may find surprising. The first is that teacher training that attempts to increase teachers' general pedagogical skills is generally not very effective; instead, training should focus on specific practical skills and specific subject matter. The second is that remote/online/distance training, while often not as effective as face-to-face training, can in at least some settings be an effective method to deliver teacher coaching.

A final point to keep in mind is that satisfying some or all these criteria does not guarantee that a teacher training program will increase student learning. Yet the more of these criteria that a teacher training program satisfies, the higher the likelihood that it will lead to increased student learning.

The findings from this section are summarized in Table 2.

Table 2. Summary of teacher training recommendations

<p>I. Effective Teacher Training Practices</p> <ol style="list-style-type: none">1. Trainers should demonstrate the pedagogical methods that they are teaching2. Allow teachers ample time to practice new pedagogical methods, especially in small groups3. Allow ample time for teachers to discuss new pedagogical methods with each other, and with the trainer4. Focus on specific practical skills, and for specific subject matter (math, reading, etc.) rather than abstract concepts5. Give practical advice on how to implement new teaching practices6. Arrange for follow-up visits to teachers' schools, so that trainers can observe teachers and provide coaching7. Provide teachers with detailed lesson plans (including scripted lessons)8. Trainers should be friendly and supportive
<hr/> <p>II. Ineffective Teacher Training Practices</p> <ol style="list-style-type: none">1. Lectures to large groups of teachers, with little time for questions/discussion2. Focus on very general, and very abstract, pedagogical methods3. General pedagogical training with no focus on specific academic subjects4. Assessing teachers to judge or penalize them rather than to provide advice on how to improve their teaching
<hr/> <p>III. Inconclusive Findings</p> <ol style="list-style-type: none">1. Unclear whether remote/distance teacher training is more or less effective than

“face-to-face” training

2. Length of training in terms of days or weeks, sometimes not enough, sometimes too long

IV. Other Recommendations

1. Some teachers may need training in the subject matter that they teach
2. Ask teachers what content (topics to cover) they would like for their training
3. Consider rewards or other types of incentives for teachers to participate in training

Source: Authors

Note: Green text (“go”) are teacher training practices that, in general, have been found to be effective. Red text (“stop”) are teacher training practices that have been found to be ineffective. Yellow text (“caution”) are teacher training practices for which the evidence is insufficient or inconclusive. Blue text are other recommendations to keep in mind when designing a teacher training program.

B. Caregiver/Parent Training

In our survey we separated caregiver/parent training from interventions that simply provided information to parents (e.g. information about the returns to education or about their child’s performance at school). Therefore, in this section, when we refer to caregiver/parent training, we are referring only to interventions that attempt to directly target the behavior of caregivers/parents to benefit their children (e.g. by training them in how to interact with their children when they are very young to better stimulate their learning). These interventions introduce new behaviors and encourage caregivers/parents to practice them.

Sixty-six percent (21/32) of the respondents to our survey are already implementing some type of caregiver/parent training. Forty-three percent (12/28) of the Christian NGO practitioners who responded to our survey wanted to see this intervention reviewed or evaluated, which made this the second most sought after intervention (see Figure 1).

Of the 29 papers we reviewed, 13 discussed caregiver/parent training. It is important to note, however, that several of those thirteen reviews cited the same one or two seminal studies. We also include one additional article (not a review) about a Christian NGO's implementation of a caregiver/parent training program in the Philippines. This article was included due to its perceived relevance to Christian NGOs.

The literature revealed four types of caregiver/parent training that have been evaluated over the last three to four decades. These four types are listed and described below in ascending order based on the number of studies that evaluated them, and on their effectiveness:

- 1) Adult literacy (plus parent training)
- 2) Parent empowerment programs to improve school quality
- 3) Multilevel interventions (i.e. multifaceted interventions that target students, teachers, and schools, and include a component of parent training)
- 4) Early childhood care and stimulation.

Adult literacy courses plus parent training to improve at-home learning have been shown to be effective for increasing student test scores; however, this has only been demonstrated by one study. The most commonly cited study on this topic was Banerji, Berry, and Shotland (2017), which was cited as a previous unpublished manuscript in the reviews of Asim et al. (2017), Damon et al. (2016; 2019), Ganimian and Murnane (2016), and Glewwe and Muralidharan (2016). Banerji, Berry, and Shotland (2017) report the results of a comparison of three interventions implemented in India that were geared toward mothers of children ages 5-8: 1) adult literacy, 2) parent training to

increase at-home learning, or 3) a combination of both. Results show that all three interventions increased children's math scores modestly, by 0.04, 0.05, and 0.07 standard deviations (SD) of the distribution of test scores, respectively, but that only the third option modestly increased children's language scores (by 0.05 SD).⁶ In contrast, an earlier study in Mozambique found no effect of a standalone adult literacy program on children's enrollment rate (cited in Damon et al. 2019). While adult literacy classes plus parent training show promise for increasing student test scores, more evaluations of similar interventions are needed.

Three reviews mentioned caregiver/parent training programs that attempt to empower parents to take a more active role in holding schools and teachers accountable. These studies showed mixed evidence of these programs' effectiveness. In Kenya, a parent empowerment program that was combined with an extra teacher program was shown to be effective (Bashir et al. 2018). The program provided randomly selected schools funds to hire an additional grade 1 contract teacher to reduce class sizes. Community members (including parents) in a random subset of these schools were given a 90-minute training on school-based management. The schools that received both interventions increased student scores by 0.20 SD, which is a large effect, whereas schools that received only the extra teacher without the parent training increased test scores only for students who were randomly assigned to the new contract teacher instead of the government teacher (Bashir et al. 2018). For students in classrooms taught by a contract teacher, scores increased by a statistically significant 0.24 SD, while

⁶ For an overview of how to interpret the effect sizes of education interventions, read <https://www.cgdev.org/blog/how-big-are-impacts-international-education-interventions>. For learning interventions, the average effect sizes range from the 25th percentile at 0.01 SD to the 50th percentile at 0.10 SD to the 75th percentile at 0.23 SD. For access interventions (i.e., enrollment, attendance, and dropout), the average effect sizes range from the 30th percentile at 0.03 SD to the 50th percentile at 0.07 SD to the 70th percentile at 0.12 SD.

those in classrooms taught by a government teacher the increase was only 0.04 SD, which was not statistically significant (Duflo et al. 2015). Another study of a parent empowerment program, in Niger, found no effect on student test scores – most likely because information constraints prevented parents from taking action to improve school quality (cited in Damon et al. 2019). According to the World Bank (2018), community monitoring is more effective when information is disseminated among multiple stakeholders (i.e. parents, teachers, and school leaders) in a way that leads to collective problem solving.

Multilevel interventions have significantly more written about them than the previous two types of caregiver/parent training; they are also much more definitively effective. A 2018 meta-analysis of over 700 rigorous impact evaluations on interventions implemented in low- and middle-income countries found that, on average, multilevel interventions that target all levels (i.e. student, teacher, school, and parent) have a moderate positive impact on student learning (0.10 SD) and a very large impact student attendance (0.25 SD) (Bashir et al. 2018). The average positive impacts of multilevel interventions on math (0.16 SD) were much stronger than on language (0.04 SD) (Bashir et al. 2018). One example of such an intervention is the BRIGHT (Burkinabe Response to Improve Girls' Chances to Succeed) that started in Burkina Faso and has been scaled up across Sub-Saharan Africa (Bashir et al. 2018). The original program constructed 132 schools and included a suite of other interventions designed to increase girls' enrollment (including a community campaign plus adult literacy training and mentoring for girls). After ten years, students from BRIGHT schools saw large positive impacts on their enrollment and test scores, especially among girls (though the magnitude did decline

over time), and higher school completion rates, especially among girls (Bashir et al. 2018).

One challenge with multi-level interventions, however, is that it is often difficult to isolate the causal component(s) driving the positive effects. It is often not clear whether the parent training arm of the intervention was necessary to achieve the specified outcomes. One randomized controlled trial (RCT) of a school-based savings program implemented in Uganda found that the savings program alone did not increase grade 5-7 students' scores but when coupled with parent training to support children, scores increased by a moderate 0.11 SD (cited in Glewwe et al. 2021). Studies like this provide at least some support for the conjecture that parent training may be necessary to increase the effectiveness of the other interventions included in the package.

Caregiver/parent training about early childhood care and stimulation was discussed in six of the reviews we examined. It was also discussed in an additional article about International Care Ministries' (ICM) programming in the Philippines (Angrist et al. 2024). There is strong evidence that it is both effective and cost effective in producing at least short-term gains for children across several outcomes. In one study, 12–24-month-old children in Jamaica who received weekly home visits by community members that demonstrated age-appropriate activities increased those children's cognitive skills by 0.26 SD and receptive language skills by 0.22 SD, which are both considered large learning impacts (cited in Ganimian and Murnane 2016). Likewise, 86 percent of children (ages 3 and 5 at the beginning of the study) in Turkey who participated in daily games and activities with their mothers were still in school seven years later, compared to 67

percent of children who did not participate in games and activities with their mothers (cited in Krishnaratne et al. 2014).

ICM's Family Academy program in the Philippines provided parents of children ages 3-5 with an in-person coach who trained them in math and phonics games for their children during twice-a-week household visits (Angrist et al. 2024). Results show that math outcomes increased by 0.52 SD for math and 0.51 SD for phonics relative to the control group, both of which are very large learning impacts. These results persisted over time somewhat, with math results improving 0.15 SD in math and phonics results improving 0.13 SD one year later (Angrist et al. 2024).

A similar intervention conducted in Jamaica from 1986-1989 resulted in increased IQ, vocabulary, and verbal reading skills, which persisted even 17-18 years after the intervention (Ganimian and Murnane 2016; Akyeampong et al. 2023). Not all studies have been able to demonstrate such long-term improvements, however. Similar programs in Jamaica, Pakistan, and China find that benefits persisted at least two to four years (and perhaps longer, but no further data were collected) after the intervention, while another in Colombia found no effects after two years (Akyeampong et al. 2023).

Occasionally, early childhood caregiver/parent training is coupled with teacher training. These interventions have had mixed effects. One teacher-training-plus-parent-training program in Ghana increased cognitive and socio-emotional skills (Evans and Mendez Acosta 2021). Yet another program of this type in Ghana caused an increase in school readiness when preschool teachers were trained, but these results were reversed after parents were trained, presumably because parents preferred traditional education rather than play-based learning (Evans and Mendez Acosta 2021).

The choice of several possible delivery methods for caregiver/parent training make it particularly cost effective. Trainings have been administered effectively via health care services, social protection services, in-home visits, group meetings, or via text “nudges” (Akyeampong et al. 2023; Angrist et al. 2024; World Bank 2018). Group meetings are likely to be more cost effective than home visits; however, home visits can be made more cost effective by using community health workers who would already be making house calls (Akyeampong et al. 2023). For comparison, ICM’s Family Program, which involved two, 45-minute home visits per week by a community member, was found to have a marginal cost of USD 32.20 per child (Angrist et al. 2024).

To summarize the results from the literature, Table 3 highlights one illustrative example of each intervention along with its impact.

Table 3. Caregiver/Parent training interventions with example studies and their impacts

Intervention	Example	Impact
<i>Adult literacy (plus parent training)</i>	India, mothers of children ages 5-8, three options: 1) adult literacy, 2) parent training to increase at-home learning, or 3) a combination of both (Banerji et al. 2017)	All three interventions increased children’s math scores (0.04, 0.05, and 0.07 SD respectively); only the third option increased children’s language scores (0.05 SD) (Banerji et al. 2017)
<i>Parent empowerment programs</i>	Kenya, additional grade one contract teacher + 90-minute training on school-based management (Bashir et al. 2018)	Schools with both interventions increased student scores (0.20 SD) Students assigned only a contract teacher increased scores (0.29)

		SD) Students assigned only a government teacher showed statistically insignificant increase (0.10 SD, not statistically significant) (Bashir et al. 2018)
<i>Multilevel interventions</i>	2018 meta-analysis of 700+ impact evaluations of multilevel interventions targeting student, teacher, school, and parent (Bashir et al. 2018)	Average positive impact on student learning (0.10 SD) and on student attendance (0.25 SD); Math impacts (0.16 SD) stronger than language impacts (0.04 SD); Difficult to tease out the effect of parent training alone, however (Bashir et al. 2018)
<i>Early childhood care and stimulation</i>	Philippines, 3-5 year old children, twice weekly home visits w/ math and phonics games taught to parents in ICM's Family Academy (Angrist et al. 2024)	For USD 32.20 per child, math and phonics outcomes increased (0.52 SD and 0.51 SD, respectively); one year later math and phonics results remained higher than the control (0.15 and 0.13 SD respectively) (Angrist et al. 2024)

Source: Authors

Note: Examples chosen are not necessarily representative of the outcomes of all studies in that category.

Given the fact that early childhood caregiver/parent training is not only effective but also cost effective, the primary recommendation for implementers of caregiver/parent training interventions is to focus training on the early childhood years. Targeting training toward parents who have young children will likely reap the largest gains in childhood outcomes. While multilevel interventions are also effective, more research is needed to determine the role that parent training plays in their effectiveness. Parent empowerment programs can be effective when they facilitate shared decision-making among relevant stakeholders to improve schools. More research is needed about the effectiveness of

adult literacy programs that train parents of older children to assist with at-home learning. These findings and recommendations are summarized below in Table 4.

Table 4. Summary of caregiver/parent training findings and recommendations

<p>I. Effective Caregiver/Parent Training Practices</p> <ol style="list-style-type: none">1. Early childhood care and stimulation is both effective and cost effective for improving cognitive outcomes and later enrollment.2. Multi-level interventions which target students, teachers, and parents simultaneously can positively impact students' learning and attendance (though it is unclear which level of the intervention drives these positive outcomes).
<p>II. Ineffective Caregiver/Parent Training Practices</p> <ol style="list-style-type: none">1. One study found that adult literacy classes alone (i.e. without parent training) did not impact children's enrollment rates.
<p>III. Inconclusive Findings</p> <ol style="list-style-type: none">1. It is difficult to isolate the parent training component of multilevel interventions to identify whether it is necessary to achieve positive results.2. Parent empowerment programs show mixed effects.3. Adult literacy programs that include a parent training component need more research as only one study has been done.
<p>IV. Other Recommendations</p> <ol style="list-style-type: none">1. The younger children are when their parents receive parent/caregiver training, the better.2. Caregiver/parent training may be made more cost effective by either holding group trainings or using community health workers to conduct home visits.

C. Job or Small-Business Training Programs

Chapter 8 of the World Bank's *World Development Report* (2018) highlights three types of job training programs: workplace training (i.e. on-the-job training for employees),

short-term job training programs (i.e. two-week to six-month trainings, often offered by non-profit organizations), and technical and vocational education and training (TVET), (i.e. six months to three years of education integrated into existing streams of lower secondary, upper secondary, or tertiary schools). The different types of job training programs are summarized below in Table 5.

Table 5. Types of job training programs

Type of Job Training	Implementer	Duration
Workplace training	Employers	Varies
Short-term job training (including small-business training)	Non-profit organizations	Two weeks to six months
Technical and vocational education and training (TVET)	Formal secondary or tertiary education system (could include private providers)	Six months to three years

Source: Authors

Of the Christian NGOs that responded to our survey, 63% (20/32) are already implementing some type of job or small-business training program. Of the 28 respondents to our survey that indicated what topics they would like to see reviewed or evaluated, 10 (36%) mentioned job training programs, which makes it tied for being the third most sought-after intervention.

Only three of the 29 reviews that we originally considered mentioned job training programs (Evans et al. 2023; Evans and Mendez Acosta 2021; World Bank 2018), and none of these specifically mentioned small-business training programs,⁷ which are a

⁷ Also known as entrepreneurial training programs or business development training programs.

common form of short-term job training implemented by Christian NGOs. For this reason, we reached out to World Bank economist David McKenzie to ask him for recommendations of recent articles about job training programs. Based on his suggestions, five articles were added to our list, for a total of eight articles about job or small-business training programs.

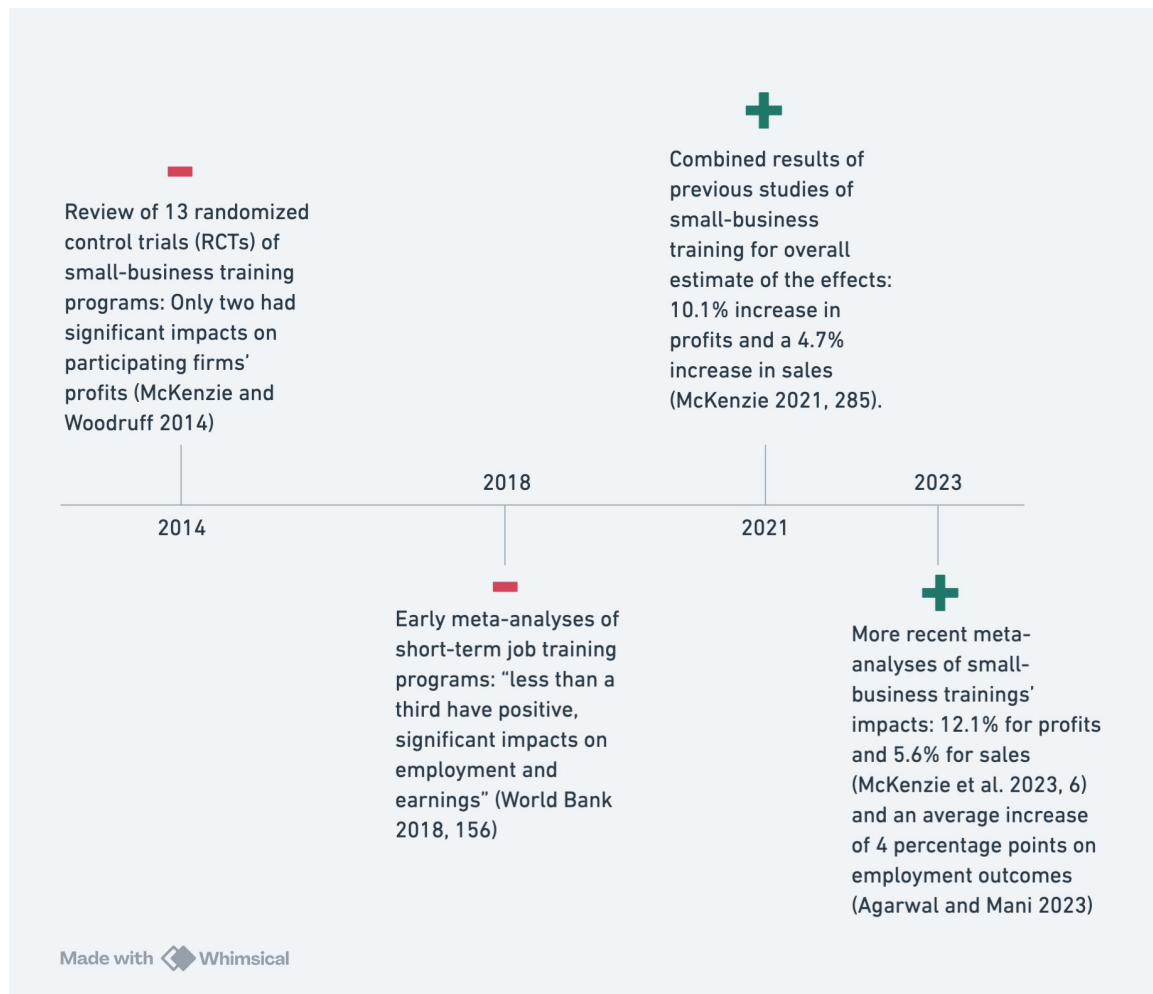
Overall, job and small-business training programs vary widely in their impacts. Programs that are designed in partnership with employers and those that specifically target and/or tailor their trainings toward disadvantaged groups, such as young women, tend to have larger impacts (Evans et al. 2023; Evans and Mendez Acosta 2021; McKenzie et al. 2023; World Bank 2018). However, it is important to note that the results of rigorous evaluations of job or small-business training programs have also changed over the years due to improving methodologies and the ability to aggregate results from multiple individual studies to detect smaller effect sizes.

Early studies of job or small-business training programs found that workplace training and TVET tended to be most effective, while short-term job training programs tended to be least effective (World Bank 2018). For example, workplace training can increase the output of workers by 10% or more, and specifically, in Kenya and Zambia, workplace training was correlated with 20% higher wages for manufacturing workers (World Bank 2018). Similarly, upper secondary TVET graduates in Brazil earn roughly 10% higher wages than their peers who have only general upper secondary credentials (World Bank 2018). By contrast, early meta-analyses of short-term job training programs found that “less than a third have positive, significant impacts on employment and earnings” (World Bank 2018, 156). Likewise, in McKenzie and Woodruff’s (2014, as cited in McKenzie

2021) review of 13 randomized controlled trials (RCTs) that implement small-business training programs, only two had significant impacts on participating firms' profits. This led many people to conclude that such small-business training programs are not effective.

Nevertheless, more recent meta-analyses of small-business training programs have found more promising results. Because small-business training is the one form of job training that is most likely being implemented by Christian NGOs, it is worth taking a closer look at these more recent results. McKenzie (2021) combined the results of previous studies to generate an overall estimate of the effects of small-business training on firms' profits and sales. He found that small-business training programs led to a 10.1% increase in profits and a 4.7% increase in sales (McKenzie 2021, 285). More recent meta-analyses support these results, with new estimates of impact at 12.1% for profits and 5.6% for sales (McKenzie et al. 2023, 6). Agarwal and Mani's (2023, as cited in Carrana and McKenzie 2024, 230) meta-analysis also finds that small-business training leads to an average increase of 4 percentage points on employment outcomes. Therefore, by looking at these aggregate effects, one can conclude that small-business training can be effective, but the results are generally too small to be detected by most individual studies (McKenzie 2021). This finding may come as a surprise to those who are familiar with earlier studies. A timeline of the changes in these findings can be found in Figure 2.

Figure 2. Timeline summary of impacts of small-business training programs



Source: Authors

Note: Initial studies of small-business training seemed to find that it was largely ineffective (-); however, more recent studies, which aggregate results of many smaller studies, have found more positive effects (+).

One reason that small-business training results are too small to be detected by individual studies is that there is less exposure to the treatment than traditional education. For example, for traditional education, we expect a 7-10% increase in income for every additional year of schooling (Carranza and McKenzie 2024; McKenzie 2021). This means that a 5-day business training would have to be nearly 20x as effective as

traditional education to achieve even a 5% increase in income (McKenzie 2021).

Another reason that effect sizes of small-business training are small is that for every 20 skills taught in these trainings, it is likely that only 1-2 get implemented by firms (McKenzie 2021; McKenzie et al. 2023).

Some promising alternatives to traditional short-term job training show larger potential impacts. Alternatives such as: tailoring programs toward specific populations, such as young women (Evans et al. 2023; Evans and Mendez Acosta 2021; McKenzie et al. 2023; World Bank 2018); using the Japanese kaizen business approach⁸; consulting; mentoring; heuristics-based training⁹; and psychology-based training (e.g. personal initiative training) show an average impact of 15% increase in profits, though it is important to note that this effect is similar to the effect of traditional training (McKenzie 2021, 293; McKenzie et al. 2023).

Job or small-business training programs that tailor their content toward women can take many different forms (including some of the other promising alternatives above), and many have been shown to have positive outcomes. In some cases, these programs provide safe spaces/after-school clubs for adolescent girls that also include training in vocational education, reproductive health, socio-emotional skills, or other life skills (World Bank 2018). Such programs have increased outcomes such as graduates' employment prospects, aspirations, non-farm employment, socio-emotional skills, and labor market outcomes (World Bank 2018). In other cases, job or small-business training programs target older female entrepreneurs. Heuristics training has been shown to be

⁸ The Japanese kaizen business approach focuses on making continuous, incremental improvements by all workers at all levels of the business.

⁹ Heuristics-based training or rule-of-thumb training is training that includes simple rules like "business and personal finances should be separate."

particularly effective with these women, especially those with lower cognitive scores (McKenzie et al. 2023). Standard small-business training coupled with topics on gender (e.g. overcoming stereotypes, entering new sectors, and working with other women) has also been shown to have a significant increase in profits and sales after 3 years (McKenzie et al. 2023). WhatsApp-facilitated mentoring relationships between female entrepreneurs in Ghana was shown to increase profits by 21% after 1 year, with the largest impacts occurring for those who were partnered with a college-educated peer who used better business practices and had higher profits and sales (McKenzie et al. 2023).

Early studies of personal initiative training found that it increased males' small business profits by USD 65 per month and females' by USD 61 per month (McKenzie 2025). However, a follow-up study seven years later found that males' treatment impact profits had increased to USD 148 per month, but females' had dropped to USD 39 per month (McKenzie 2025). An initial, informal examination into why this might be the case suggests that because females tend to work in commerce while males work in fields like manufacturing, construction, and repair services, females experience less demand for their services and reach their efficient scale much faster than males, thus restricting their long-term business growth (McKenzie 2025).

According to the World Bank (2018) report, there are several common features of successful job training programs whether they are offered to men or women or offered by workplaces, NGOs, or the formal education system. First, partnerships with employers or with non-profits who know the labor market and potential employers well should be established before the job training is designed. A clear integration between

the training and potential employment opportunities will lead to better labor market outcomes, increased productivity, and decreased employee turnover. Second, classroom and workplace learning should be integrated as much as possible. Formal apprenticeships are a proven way to make this happen. In Brazil, graduates of a formal apprenticeship program were more likely than their peers with other formal, temporary contract work to find permanent, higher paying jobs, and these gains were stronger for less educated workers (World Bank 2018, 158). Third, job or small-business training programs need to have capable teaching staff who are skilled not only in pedagogy but also in technical expertise. Finally, comprehensive student support services for career decision-making need to be made available. Students need to be trained not only in the technical skills that they need for a specific job but also in the job-seeking skills that they need to navigate the labor market and find a good career fit (World Bank 2018). Table 6 summarizes the findings and recommendations presented in this section.

Table 6. Summary of job training recommendations

<p>I. Effective Job Training Practices</p> <ol style="list-style-type: none">1. Programs that are designed in partnership with employers tend to have larger impacts.2. Programs that target and/or tailor training toward disadvantaged groups, such as young women, tend to have larger impacts.3. Workplace training and TVET tend to be more effective than short-term job training, in part because the exposure to treatment is much higher than for short-term job training.
<p>II. Ineffective Job Training Practices</p> <ol style="list-style-type: none">1. Historically, short-term job training (including small-business training) was thought to be ineffective, but more recent studies have found that it simply has smaller effect sizes than workplace training and TVET because participants are exposed to the treatment for less time and because on average participants implement only 1-2 of

the 20 skills they learn in the training.

III. Inconclusive Findings

1. Alternatives to traditional short-term job training (e.g. Japanese kaizen business approach, consulting, mentoring, heuristics-based training, and personal initiative training), which can facilitate greater uptake of best business practices, hold promise, but more research is needed.
-

IV. Other Recommendations

1. Integrate training and work as much as possible (e.g. through apprenticeships).
 2. Use trainers who are skilled in both technical expertise and pedagogy.
 3. Provide students with support for job-seeking skills, not just technical skills.
-

Source: Authors

D. Educational Technology (EdTech)

Educational Technology (“EdTech”) refers to “any application of information and communication technologies (ICT) in education” (Rodriguez-Segura 2022). That includes, but is not limited to, interventions that use technology to enable the delivery of instruction (online classes), to improve instruction, to provide a channel for encouraging student effort (behavior-shaping inventions). Those can be done through the provision of hardware and/or software, as well as simply leveraging existing hardware and software (such as sending text to students who have phones).

According to Rodriguez-Segura (2022), EdTech interventions can be classified into four categories:

- (1) Access to technology hardware (additional inputs alone, which includes computers for classrooms; laptop computers provided to students; tablets for students to use; equipment to connect to the internet);

(2) Technology-enabled behavioral interventions (such as sending text messages to parents or students via mobile phones);

(3) Improvements to instruction (such as educational software¹⁰ for students and teachers to use; digital literacy/computer skills training; and use of instructional videos for numeracy/literacy outside of the classroom);

(4) Self-led learning (computer-assisted learning [CAL], such as educational software for students to use—including smart phone apps; these are typically adaptive, tailored to the students' level).

About 66% (21/32) of the Christian NGOs in our survey reported providing at least one type of EdTech intervention in their programs. Around 36% (10/28) expressed interest in seeing a review on this topic, making it tied with job or small-business training programs as the third most requested topic.

Of the 29 initial literature reviews that we considered, 23 mentioned one or more EdTech interventions. One review in particular focused exclusively on EdTech: Rodriguez-Segura (2022) reviewed and synthesized the evidence from 81 “core studies” from 2002 onward across 36 developing countries.

¹⁰ Some of these interventions include the provision of hardware needed for using the software. Others were implemented where hardware was already available. This is the same for self-led learning.

The rise in the adoption of technology¹¹ and the proliferation of educational technology products have led to increased interest from policy makers and practitioners in using them as a promising path to address some of the most pressing challenges within educational systems in developing countries, such as the lack of teachers in remote areas and high student-teacher ratios. EdTech has been adopted at even higher rates since 2020 due to the COVID-19 pandemic lockdowns and school closures.

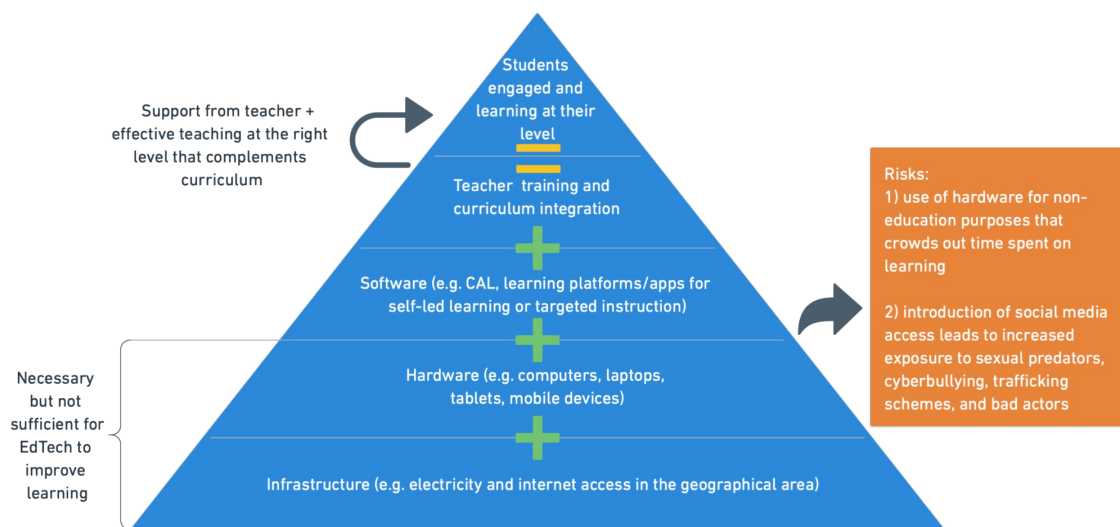
It is important to recognize that the circumstances surrounding EdTech in developed countries often differ significantly from those in developing countries. Remote areas in developing countries often lack internet access and electricity, as well as access to hardware. Therefore, an intervention that was previously cost-effective in a context where students already had smartphones and high-speed internet would require an extra investment in infrastructure, hardware, and software in a developing context. This impacts the feasibility and cost-effectiveness of the intervention. In these contexts, interventions could be designed to first address these above-mentioned limitations, and the costs of doing this should be considered. Also, there could be more than one way to overcome these limitations. For example, even if it is not feasible to connect a remote area to the power grid, it may be possible to provide electricity via solar power or generators that run on diesel or other fuels. It may also be possible to provide satellite

¹¹ In the most recent years, particularly after November of 2022 with the release of ChatGPT to the world by OpenAI, there has been a proliferation of the application and adoption of AI in education. To our knowledge, there are still very few studies that have rigorously evaluated the impact of AI technologies in developing countries' education, and no systematic literature review. Therefore, AI is not covered in this section. There are some evaluations that could be a helpful starting point for a future review paper on AI interventions in the context of developing countries. One example is the "Evaluations of AI and machine learning: Education" section in <https://www.povertyactionlab.org/page/artificial-intelligence-social-good>. There was also a pilot in Nigeria evaluating AI chatbots in education: <https://blogs.worldbank.org/en/education/From-chalkboards-to-chatbots-Transforming-learning-in-Nigeria>.

internet in remote areas for connectivity. Either way, it is better to focus on interventions that have proven to be effective in developing contexts to draw policy implications.

The main finding across reviews is that investing in education technology hardware alone is almost always an inefficient use of funds to improve learning outcomes (Akyeampong et al. 2023). The key factor is *how* the technology will be used by teachers, students, or parents (Akyeampong et al. 2023). Figure 3 illustrates how different types of EdTech interventions are interdependent, with types in the lower part of the diagram serving as foundational prerequisites for the types that are above them.

Figure 3. Interdependence of Common EdTech Investments



Source: Authors

Note: The top of the pyramid represents the desired outcome. Each layer is an investment added on top of the preceding one in order for EdTech interventions to be effective.

As practitioners consider different contexts, they will recognize that programs in different geographical locations may start at different steps of the pyramid. Some may already include hardware, while others may not even have access to the internet and electricity.

Cost-effectiveness is highly dependent on which stage of the pyramid the community is at.

Evaluations of programs that provide students with laptops, such as the “One Laptop Per Child” (OLPC) program, or with handheld devices (tablets, e-readers), reveal a null median effect on learning outcomes (Glewwe and Muralidharan 2016; Kremer et al. 2013; Muralidharan 2017; Rodriguez-Segura 2022; Snilstveit et al. 2016). This may be explained by the fact that there was no intentionality in providing software that tailored the instruction to the student’s level (Kremer et al. 2013; Rodriguez-Segura 2022). In some cases, the introduction of computers or tablets has been associated with decreased education performance, attributed to reduced time spent on homework. If increasing learning outcomes is the goal, providing hardware alone is not a recommended investment. When the desired outcome is solely to increase student’s familiarity with technology, access to hardware can be beneficial—but it’s a costly choice that generates exposure to risks¹² and may lead to less time spent on outdoor activities and homework.

Linden (2008), as cited by Damon et al. (2019), Glewwe et al. (2022), Ganimian and Murnane (2016), and Glewwe and Muralidharan (2016), found positive (albeit insignificant) effects for after-school CAL/ICT in India but large negative effects (-0.55 SD) for CAL/ICT during regular class time. Linden suggests that teachers had difficulties

¹² A major risk for vulnerable children and youth is that they can become easy targets for online predators who use social media to manipulate and groom them, increasing the danger of trafficking. With the advancements of technology, particularly Generative AI, it has become easier even for other children to produce harmful content of each other. According to Thorn Research this has become already a pervasive issue among teenagers in the United States <https://www.thorn.org/research/>. The set of papers we reviewed did not include any evaluation of interventions that sought to address these risks through education, such as awareness workshops for children and caregivers, or classes about preventing issues, respecting peers, etc. It is a relevant area for future research.

in modifying classroom pedagogy to use technology effectively, so introducing computers could reduce learning if they disrupt effective pre-existing instructional methods. (Akyeampong et al. 2023) suggest that crowding out instruction time, rather than complementing it, is a common pattern.

Even when the intervention is effective, it is important to consider whether it is indeed cost-effective as compared to its alternatives. For example, (Banerjee et al. 2007), as cited by Glewwe et al. (2020), find that a two-year program providing computer-based mathematics instruction for two hours per week increased test scores by 0.48 SD, and then faded to 0.10 SD after the program ended, but this was less cost-effective than a remedial instruction program.

Another risk of introducing access to technology is that it may increase the time that students spend playing games and reduce the time spent reading and doing homework, as happened in a program in Romania that provided vouchers for parents of middle-school students to purchase computers. The intervention significantly reduced students' academic performance (Damon et al. 2019).

Three studies evaluated the provision of infrastructure to provide internet access in a remote area: (i) Large-scale provision of internet access in public schools in Peru (Kho et al. 2018)), (ii) *telesecundarias*, a large-scale intervention in Mexico to provide remote instruction to students in rural communities (Navarro-Sola 2019), and (iii) electrification and provision of instruction-enhancing tools in Tanzania (Seo 2017). The target group for these types of interventions were not merely individual schools, but whole regions that were technologically lagging behind other areas in the country. These types of

intervention require a significant investment and are the basis for other types of EdTech programs. Table 7 explains each intervention.

Table 7. Studies on the provision of infrastructure in remote areas

Type	<i>Internet access</i>	<i>Remote instruction</i>	<i>Solar panels and digital media</i>
Intervention	Provision of internet access at scale in remote areas (Kho et al. 2018)	<i>Telesecundarias</i> (remote instruction) for rural areas (Navarro-Sola 2019)	<i>GivePower</i> : Electrification to 20% of classrooms and offices through solar panels, combined with provision of educational and socio-emotional videos (Seo 2017)
Scope	5,903 public primary schools gained internet connections	2,663 telesecundarias, with more than 83% being constructed in rural areas	164 Tanzanian Secondary Schools divided into six groups: (i) solar home systems including lights and TVs (ii) solar facilities and English videos; (iii) solar facilities and bilingual videos; (iv) English videos only; (v) bilingual videos only; (vi) and control schools
Country (Years)	Peru (2007-2014)	Mexico (1968-2000)	Tanzania (2016)
Effectiveness	In the short-run, there was a moderate, positive impact on school-average standardized math scores (0.042–0.076 SD). Importantly, this effect grows over time, at a rate of 0.047 SD per year, reaching 0.29 SD 5 years after installation. Using an extended evaluation window allows the effects of school-based internet on learning to materialize.	For every additional telesecundaria per 50 children, ten students enroll in junior secondary education	The impact of programs enabled by solar facilities, averaged across video-provision status, was 0.05 SD on secondary exit exam (across all subjects), and 2.8 percentage points on passing rates
Other considerations	Schools require time to adapt to internet access by hiring teachers with	A shift away from agriculture and the informal sector partly explains long-run income increases of 12.5–13.9% for	The cost was USD 6.41 per student

	computer training. Complementary investments are necessary to fully exploit new technological inputs.	each additional year of education	
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Source: Authors

These studies suggest that provision of infrastructure may require time to yield effects and may also require complementary interventions such as teacher training. With advancements in technology, it may be that access to infrastructure and hardware will immediately provide access to high-quality online instruction and software for zero or very low cost. Two examples of this are connecting to YouTube videos, or to educational websites. If children have information about where to find these free educational resources on the internet, it could be that the transition from hardware to software to learning outcomes may increasingly happen more smoothly and quickly than in the past. However, if there is information asymmetry about the returns to education and children are not motivated to pursue these educational resources, the gap would still remain. In these cases, technology-led behavioral interventions may be effective to bridge that gap. These are still hypotheses based on patterns observed in previous evaluations. Evaluations conducted in coming years may bring clarity to whether the provision of hardware could be effective in this new context, or if the null median results persist, despite technological advancements.

Technology-enabled behavioral interventions result in low to medium effects, but are highly cost-effective, due to their low cost and scalability. These types of interventions require “deep knowledge about the specific constraints to be relieved, the availability of a channel through which behavior-shaping incentives can flow, and a well-designed intervention informed by a credible theory of change” (Rodriguez-Segura, 2022). They

may be aimed at affecting either teacher, parent or student behavior, as explained in Table 8 below.

Table 8. Types of technology-enabled behavioral interventions

Target group	Teachers		Students	Parents/ Caregivers
Type of Intervention	Increase accountability	Provide Information	Provide Information	Provide Information
Constraints examples/ Policy challenge	Teacher absenteeism and low in-person instruction (67% is lost in Kenya and only 1h33 min/day of in-person instruction is provided in Mozambique)	Program fidelity and schedule	Information asymmetry: perceived returns to education Lack of contact with role models	Information asymmetry between parents and students
Intervention examples	Cameras + conditional payment (India) Send pictures (Haiti)	Reminders about deadlines	Showing movie with role model to grade 10,12,13 Ugandan students (Riley 2017) Contextually sensitive videos and infographics about returns to education (Neilson et al. 2018)	Accountability through high-frequency texts about student's performance, attendance and behavior
Effectiveness	Effective (in India, 0.17–0.20 SD increase in test scores) Conclusion: "EdTech could prove a valuable tool in shaping teacher accountability and performance, potentially even more so than other traditional channels like salary increases, if the right behavioral constraints are targeted by the technology."	Small effects (i.e., less than 0.10 SD)	0.11 SD in math for grade 10, 0.13 SD in math for grade 12; 9 percentage points more likely to continue enrolled in secondary school (Riley 2017) Decreases in school dropout, and increases in standardized test scores (Neilson et al. 2018)	Large effects on test scores and attendance after only four months of the intervention (Berlinski et al. 2016)
Cost-effectiveness	Highly cost-effective due to low cost and scalability	Highly cost-effective due to low cost and scalability	Highly cost-effective due to low cost and scalability USD 5 per student (Riley 2017) and about USD 0.86 per student (Neilson et al. 2018) noting that the major costs were production and elaboration of the videos USD 104,000. It was shown to about 120,000 students. The marginal cost was minimal.	Highly cost-effective due to low cost and scalability
Implementation considerations	Risk of low implementation and take up, which may hinder effectiveness; support of local partners in its design is crucial Deepfake/AI image generation may cause this to be obsolete if teachers have control over the	Information provided should be actionable, relevant, and not overwhelming	Information provided should be actionable, relevant, and not overwhelming	Information provided should be actionable, relevant, and not overwhelming

	images they submit			
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Source: Authors

This type involves an in-depth understanding of the local context and the specific local constraints. We recommend that practitioners consider these types of interventions as complementary to other core educational policies, due to the low cost and ease of scalability that make them highly cost-effective.

To address the gaps in the quality of instruction, technology can enable remote instruction¹³, complement teacher instruction in the classroom, and enable remote coaching and meetings. These types of interventions have consistently been shown to deliver medium to high effects, and are highly cost-effective. Table 9 summarizes each of these approaches, according to the constraints each one is better suited to address.

Table 9. Types of EdTech aimed at improving instruction

Category	Remote instruction (online classes)	Complementing and shaping of classroom instruction	Remote engagement with teachers and parents
Definition	Connecting students with knowledgeable, engaging, and curriculum-specific remote instruction, typically via pre-recorded videos, live streaming	Teachers complement typical instruction with some technological element. This may happen after-school or in-classroom, with the supervision of teachers.	Programs that leverage technology to connect remotely with teachers and parents. Online teacher coaching (vs. on-site teacher training), online parent meetings.
Constraints addressed	Teacher knowledge or effectiveness. That is, lack of local teachers that both master the content and are actively engaged (including teachers who are chronically absent or disengaged).	Teacher knowledge or effectiveness. It also includes situations where teachers cannot deliver content to the full range of achievement levels within their classrooms.	Scalability of on-site teacher training; virtual training being typically slightly cheaper; logistically, less challenging to scale. However, Cilliers et al. (2022) showed diminishing returns to virtual coaching in the longer term.

¹³ Free or low-cost instructional videos on streaming platforms such as YouTube have made the access to a variety of high-quality content even easier, given that there is access to the internet, technology, and awareness of where to start, where to find.

Approach	(Partial) substitute to instruction Satellite, radio broadcast; either live or recorded. Can include local adaptation.	Full customization of the study program to each student's particular weakness Lesson scripts Sometimes is combined with the provision of hardware	Reducing travel and logistic costs, increasing scalability
Effectiveness	0.1-0.4 SD, evaluated in different contexts and dating back to 1974	Mostly effective Exception/cautionary tale: worse interactions between teachers and their students led to negative effects (Berlinski and Busso 2017)	Positive, but with diminishing returns over time (Cilliers et al. 2020)
	Median effect size of 0.28 SD		
Cost-effectiveness	High for at scale Costs are mostly fixed costs. Marginal costs are low.	Depends on what infrastructure and hardware is already in place	Scalable
Implementation considerations	Requires electricity and provision of hardware (such as tablets)		
	Concerns about the effect on levels of engagement and potential negative effect on the component of personal relationships		
	"Proper identification of contextual binding constraints when it comes to instruction seems to be a common thread. The design of the intervention around the issue at hand was key to improving learning levels."		

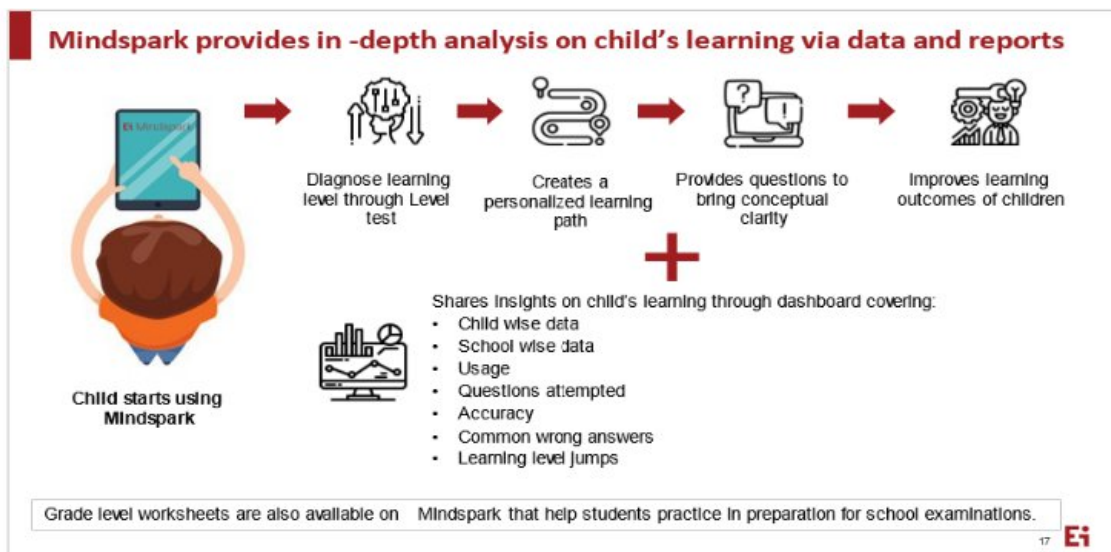
Source: Authors

Self-led learning has been proven to result in medium to large effects. One example of adaptive software is the Mindspark¹⁴ app by Education Initiatives (Stern, Jordan, et al. 2023). The software was developed from a question bank of over 45,000 questions and two million data points of student-item responses to calibrate the questions to students' levels. This ability for targeting the content to the student's right level is a key element of success for the app (Stern, Jordan, et al. 2023). Furthermore, conceptual misunderstandings are identified by an algorithm that analyzes patterns of the student's

¹⁴ <https://mindspark.in/>

responses (Muralidharan 2017). Mindspark allows students to master foundational skills before they move on to more difficult ones. Figure 4 explains how the software works.

Figure 4. How Mindspark works



Source: Stern, Jordan, et al. (2023)

Notes: This theory of change illustrates how one adaptive software for math instruction works. The ability to diagnose learning level and iteratively personalize the child's learning path is a component that incorporates best practices of effective pedagogy.

An evaluation conducted by the Abdul Latif Poverty Action Lab in 2015 and 2016 in five public middle schools Delhi found that students who received the Mindspark intervention scored 0.37 SD higher than the control group at the end of one year, and improved their scores by more than double the control group over the intervention period (Stern, Jordan, et al. 2023).

A Colombian CAL program did not improve test scores, possibly because the software was not tied to the curriculum and therefore not widely used (Kremer et al. 2013).

Conn (2017) found that computer-assisted led learning had the highest pooled effect in a comparison of 66 separate experiments. In particular, the adaptive learning techniques

through computer-assisted learning and after-school targeted remedial education were found to be especially effective.

Ganimian and Murnane (2016) concluded that CAL programs “are most effective when they are a complement to rather than a substitute for conventional classroom instruction.” In India, a CAL program implemented in 2004 had two treatment arms: one which took place out-of-school (before or after) and improved students' math test scores by 0.28 SDs. The second treatment arm was a pull-out program that happened for 2 hours during school and *reduced* achievement by 0.57 SDs. However, implementation of CAL during computer classes were found to be effective in China, improving the math test scores of third and fifth graders by 0.16 SDs.

The small or negative results may be explained by the qualitative evidence suggesting technological issues, lack of sufficient training for teachers, low use of laptops and a lack of integration of CAL into existing learning approaches (Snilstveit et al. 2016).

Table 10 summarizes the different types of education interventions.

Table 10. Summary of EdTech interventions in developing countries by thematic area

	Access to technology	Technology-enabled behavioral Interventions	Improvements to instruction	Self-led learning
Intended policy targets	Low penetration of technologies capable of hosting educational features; low familiarity with digital skills.	Informational barriers; behavioral inconsistencies; lack of accountability; alignment of incentives.	Gaps in teacher knowledge; difficulties of recruiting teachers in remote areas; scalability of student and teacher training programs.	Reinforcement of material and practice problems; addressing student-specific gaps in skills; adjusting the pace and level of instruction.
Effectiveness	Very low effects on academic learning; medium effects on increasing familiarity	Low to medium effects on learning outcomes.	Consistently medium to large effects on learning outcomes.	Among the software evaluated, consistently medium to large effects on learning outcomes.

	with digital tools.			
Cost-effectiveness	Extremely low. Poor effectiveness coupled with high marginal costs. As a result, expensive to scale.	Very high, particularly due to the very low marginal costs of most interventions. Very high potential for scalability.	High, as fixed costs of product development tend to be higher than marginal costs.	High, as interventions are often implemented in community or school level computer labs so the same hardware/software can reach many students.
Best uses	Increase familiarity with technology; or as a platform to implement other types of EdTech interventions.	Improve enforcements of policies; provide information at scale.	Deliver high-quality education to areas where this is a serious constraint.	Complement classroom instruction; reinforce lessons; fill in content gaps.
Potential pitfalls and challenges	Leakage and misuse of equipment; crowding out of time better spent in other educational activities.	Interventions require particularly deep contextual knowledge about behaviors that can be shaped through relatively low-touch interventions.	A sudden change in technology that does not directly address a pressing problem may hinder instruction and lead to negative effects in learning.	Software needs to be developed for more contexts, languages, and subjects. Reliance on self-guidance may benefit high achievers more; increasing within-class inequality.
Examples of interventions	One-laptop-per-child (OLPC) (Barrera-Osorio and Linden 2009; Cristia et al. 2017); provision of handheld devices (Habyarimana and Sabarwal 2018; Mensch and Haberland 2018).	Keeping parents up to date on student performance and attendance via SMS (Berlinski et al. 2016); monitoring teacher attendance through cameras linked to pay incentives (Gaduh et al. 2020).	Broadcasting of live instruction remotely (Johnston and Ksoll 2017); pre-recorded video and audio lessons to supplement classroom instruction (Beg et al. 2019; Näslund-Hadley et al. 2014).	Software (typically self-adaptive) to practice language and math skills (Araya et al. 2019; Carrillo et al. 2011; Linden 2008; Muralidharan et al. 2019); online classes (Chong et al. 2020).

Source: Rodriguez-Segura (2022)

The main finding that may be surprising to some practitioners is that providing access to technology alone should not be seen as the sufficient and effective solution to increasing learning outcomes. Given the advancements of technology, such as high-quality instructional videos and educational chatbots, future evaluations may shed light on whether the effectiveness of access to hardware would remain at an average median effect, or if it could be improved when combined with technology-enabled behavioral interventions.

Table 11 summarizes the findings of this section.

Table 11. Summary of EdTech Findings

I. Effective EdTech

1. Investment in software that is tailored to student’s level, combined with teacher training and curriculum integration
2. Technology-led behavioral interventions, which use technology to influence behavior. Typically, they have a low cost of scaling.

II. Ineffective EdTech

1. Investment in hardware alone, without integration with curriculum, software, and teacher training

III. Inconclusive Findings

1. The studies about using technology to aid parents in directly supporting their children’s education and about leveraging technology to inform students about opportunities and deadlines to further their education were done in developed countries. Thus, their effectiveness remains fairly unexplored in developing contexts.
2. There was no information about interventions specifically designed to improve digital skills.

IV. Other Recommendations

1. More research is needed on interventions that educate children to navigate digital tools safely and responsibly, avoiding common pitfalls such as crowding out homework time and exposure to bad actors (sexual predators, cyberbullies, scams, traffickers).
2. Types of EdTech interventions that complement rather than substitute for classroom instruction are typically *more* effective, though both types are generally effective.

Source: Authors

E. Socio-emotional learning (SEL)

Socio-emotional learning (SEL) is the process of effectively acquiring and applying socio-emotional skills (Durlak et al. 2011; Payton et al. 2008) as cited by (Puerta et al. 2016). Socio-emotional skills are defined in the psychology literature as the group of attitudes, behaviors and personality traits that help individuals across the dimensions of

goal achievement, emotion management, and teamwork (Cunningham et al. 2016). These are skills that “enable individuals to (a) recognize and manage their emotions, (b) cope successfully with conflict, (c) navigate interpersonal problem solving, (d) understand and show empathy for others, (e) establish and maintain positive relationships, (f) make ethical and safe choices, (g) contribute constructively to their community, and (h) set and achieve positive goals” (Durlak et al. 2011; Payton et al. 2008 as cited by Puerta et al. 2016). Cognitive and socio-emotional skills combine to determine people's behavior and more generally, their life outcomes (Cunningham et al. 2016).

The terminology we use in this review, “socio-emotional skills”—also referred to as “social and emotional skills”, “socioemotional skills” and “social, emotional, and behavioral (SEB) skills”—is commonly used in the psychology literature. However, literature in other domains often uses other terms that essentially refer to the same underlying concept. For example, some similar terms are: non-cognitive skills (economics), soft skills (business and management), personality traits and temperament (psychology literature, e.g. the Big Five), twenty-first century skills/competencies (UNESCO, UNICEF, WHO; and the PYD¹⁵ literature), life skills (UNESCO, UNICEF, WHO; and the PYD literature), and character skills (psychology and theology).

Exactly half (16/32) of the Christian NGOs that responded to our survey reported already implementing some type of socio-emotional learning. More than half 19/32 (59%) are implementing Christ-like character development programs, which likely includes

¹⁵ Positive Youth Development is a field of study in the psychology and child development literature. Richard M. Lerner and Jaqueline V. Lerner developed the Five Cs of PYD <http://exploresel.gse.harvard.edu/frameworks/52>.

establishing and maintaining positive relationships, making ethical and safe choices, and other behaviors that can be described as socio-emotional skills.¹⁶ Advice on socio-emotional learning programs was requested by 32% (9/28) of the respondents to our survey, which was tied for the fifth highest total.

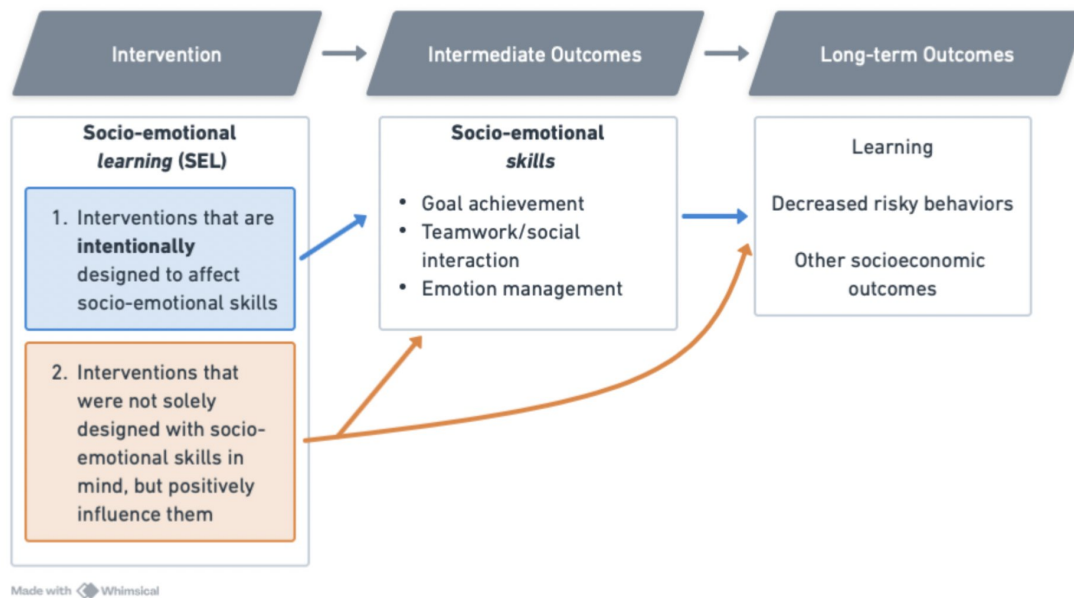
Eight out of the 29 literature reviews that we read included at least one study that covered socio-emotional learning, or a section discussing the importance of socio-emotional skills. One article in the original set of reviews (Akyeampong et al. 2023) cited two other systematic reviews (Cunningham et al. 2016; Puerta et al. 2016) that exclusively focused on socio-emotional learning, and thus, provided a more comprehensive view of the topic. Additionally, we learned about two papers that discussed and evaluated the effectiveness of interventions implemented by two Christian NGOs on academic outcomes, which were in part mediated by socio-emotional skills. We decided to add these two reviews and these two papers to our initial list of reviews. Therefore, this subsection will summarize the findings from 12 publications, of which ten are literature reviews and two are recent evaluations of specific interventions.

Before discussing socio-emotional learning (SEL) programs, we will discuss the importance of having socio-emotional skills for positive educational and life outcomes. Socio-emotional skills have gained increasing attention in the education literature, as mounting evidence indicates their importance for educational and wellbeing outcomes (Akyeampong et al. 2023; Cunningham et al. 2016; Puerta et al. 2016). For example,

¹⁶ Maintaining positive relationships, for example, is core to the Christian faith, and has its basis and motivation in the love of God, as illustrated by this Bible passage in 1 John 4:9-11 (NKJV), “In this the love of God was manifested toward us, that God has sent His only begotten Son into the world, that we might live through Him. In this is love, not that we loved God, but that He loved us and sent His Son to be the propitiation for our sins. Beloved, if God so loved us, we also ought to love one another.”

self-control and perseverance may be as, or even more, important predictors of schooling, wages, and other positive socioeconomic outcomes than cognitive indicators such as IQ (Psaki et al. 2022). Sometimes, this effect may be mediated through school performance, as measured through increased test scores. That was the case with curriculum and activities designed to encourage grit among students in Turkey which improved literacy and math scores (Glewwe et al. 2022). But socio-emotional skills can also have a direct effect that is not mediated through academic performance, as many studies showed no effect of SEL interventions on literacy and math test scores, while showing effects on other outcomes such as mental health and labor market participation in adulthood (Akyeampong et al. 2023). Figure 5 shows how interventions may affect socio-emotional skills, which may in turn affect other outcomes. Socio-emotional skills are positively correlated with labor earnings, employment and productive activity, job type, and tertiary school attendance, while being negatively correlated with risky behaviors or outcomes such as participation in illegal activities, smoking and unplanned pregnancies (Cunningham et al. 2016; Puerta et al. 2016).

Figure 5. SEL and socio-emotional skills distinction



Source: Authors

Notes: Socio-emotional skills can be achieved both through (1) Interventions that are intentionally designed to affect socio-emotional skills and labeled as such, or (2) interventions that were not solely designed with socio-emotional skills in mind but positively affect them. Socio-emotional skills affect long-term outcomes.

However, children and youth in many of the contexts where Christian NGOs operate are failing to acquire socio-emotional skills. For example, a study with data from 35 low- and middle-income countries estimated that a third of children ages 3 and 4 fail to meet basic milestones in socio-emotional development, such as being able to avoid distractions, get along with others, and control aggressive behaviors (World Bank 2018). Therefore, the evidence in the education literature reveals both its importance for life outcomes, as well as its need.

Additionally, socio-emotional skills are relevant for Christian NGOs implementing education interventions, because the Bible places a high importance on them. For

example, the apostle Peter instructs Christians in his second letter (*New International Version*, 2 Peter 1:3-9) to “make every effort to add to your faith virtue; and to virtue, knowledge; and to knowledge, self-control; and to self-control, perseverance; and to perseverance, godliness; and to godliness, brotherly kindness; and to brotherly kindness, love.” He states the importance of intentionally pursuing these “socio-emotional skills”, saying, “if you possess these qualities and continue to grow in them, they will keep you from being ineffective and unproductive in your knowledge of our Lord Jesus Christ.” He goes on to warn: “but whoever lacks these traits is nearsighted to the point of blindness, having forgotten that he has been cleansed from his past sins.” In the preceding verses, Peter gives the underlying motivation, saying that “the very reason” to pursue these qualities is because “[God’s] divine power has given us everything we need for life and godliness through the knowledge of Him [Jesus] who called us by His own glory and excellence. Through these He has given us His precious and magnificent promises, so that through them you may become partakers of the divine nature, now that you have escaped the corruption in the world caused by evil desires.” Therefore, socio-emotional skills are an important part of the Christian faith and, consequently, are relevant for Christian NGOs.

The remainder of this subsection will seek to provide helpful guidelines for Christian NGOs seeking to foster socio-emotional skills in their participants. We will show what works, and by which mechanisms, as well as what does not work.

Puerta et al. (2016) reviewed several evaluations of SEL interventions, and found that successful SEL programs followed an approach that was sequenced, active, focused, and explicit (SAFE):

- 1) **Sequenced:** using a step-by-step approach to develop skills through a set plan of activities,
- 2) **Active:** applying the skills taught, through activities such as role playing,
- 3) **Focused:** allotting sufficient time and attention to the development of socio-emotional skills,
- 4) **Explicit:** clearly identifying the socioemotional skills that are aimed to be developed as a result of the intervention.

To help Christian NGOs be “explicit” as they pursue SEL, we will present different groupings of socio-emotional skills, as delineated by Cunningham et al. (2016).

The first grouping is a widely accepted taxonomy to measure personality traits: the Big Five Model (Goldberg 1993). The five traits are (1) openness to experience, (2) conscientiousness, (3) extroversion, (4) agreeableness, and (5) emotional stability. These traits and their descriptors are shown in Table 12. It is helpful to understand the Big Five traits as “measures of where a person is located along the continuum of a personality facet as opposed to a measure of trait desirability,” since “unlike cognitive skills, socioemotional skills are not necessarily monotonically increasing in desirability” (Cunningham et al. 2016).

Table 12. Interpretation of Low and High Scores of Big Five Personality Traits

Big Five Personality trait	Low Score	High Score
<i>Openness to experience</i>	Routine, straightforward	Complex, experimental
<i>Conscientiousness</i>	Spontaneous	Self-disciplined, planned

<i>Extroversion</i>	Energized by internal stimulation	Energized by external stimulation
<i>Agreeableness</i>	Self-interested, suspicious	Kind, willing to compromise
<i>Emotional stability</i>	Anxious, reactive	Resilient, calm

Source: Cunningham et al. (2016).

The second grouping divides skills into three areas. Table 13 contains definitions in the fourth column and the relationship to the Big Five dimensions in the third column (“Specific skill”) of the Socio-emotional type of skill. It also contains the definition of basic cognitive skills, which is helpful to differentiate them from socio-emotional skills.

Table 13. Definitions of skill measures

<i>Type of skill</i>	<i>Dimension</i>	<i>Specific skill</i>	<i>Definition</i>	<i>Survey Measure</i>
Basic cognitive	Basic academic knowledge and reasoning	Memory	Short-term memory, representative of working memory	All basic cognitive skills are measured by direct assessments (tests)
		Math ability	Ability to perform basic arithmetic operations, such as addition, subtraction, multiplication and percentage	
		Reading proficiency	Ability to understand, use, evaluate and engage with written texts	
		Verbal ability	Receptive vocabulary and verbal ability of adults	
		Verbal fluency	Speed and ease with which words are accessed from memory	
Socio-emotional	Achieving goals	Conscientiousness	Tendency to be organized, responsible, and	All socio-emotional skills

		hardworking	are measured by aggregating self-reported items from individuals filling out questionnaires
	Openness to experience	Appreciation for art, learning, unusual ideas and variety of experience	
	Grit	Perseverance and passion for long-term goals	
Working with others	Agreeableness	Tendency to act in cooperative, unselfish manner	
	Extroversion	Sociability, tendency to seek stimulation in company of others, talkativeness	
Managing emotions	Emotional stability	Predictability and consistency in emotional reactions; absence of rapid mood changes	
	Hostile attribution bias	Tendency to perceive hostile intents in others	
	Decision making	Manner in which decision situations are approached	

Source: John and Srivastava (1999); Cueto, Munoz and Baertl (2010); Almlund et al. (2011); ETS (2014); SEMS (2014); World Bank (2014a); (2014b); OECD (2015).

The third grouping of socio-emotional skills, called PRACTICE, groups them into seven areas, as presented below in Table 14.

Table 14. Definitions of PRACTICE skills

<i>Skill</i>	<i>Definition</i>
(Social) Problem solving	Set of information-processing skills that determine how individuals solve social problems, such as attention to relevant cues, interpretation of cues and emotional reactions, goal setting and planning, access to behavioral responses from memory, evaluation of responses, decision making, behavioral enactment, and reflection.

Resilience	Ability to bounce back from adversity and thrive in the context of risk. Encompasses ability to realistically connect future goals and opportunities to one's own abilities and to adapt as needed to situational constraints.
Achievement motivation	Orientation toward success, mastery, and sense of purpose. Associated with high degree of independence and capacity and drive to pursue difficult tasks and work toward desired goals.
Control (self-control)	Range of self-regulatory skills that allow individuals to modulate and restrain their impulses, including ability to focus attention, delay gratification, and inhibit impulsive responding.
Teamwork	Skills involved with getting along with others, understanding their feelings and points of view, communicating effectively, being helpful and agreeable, and not engaging in aggressive or bullying behaviors.
Initiative	Personal agency and internal locus of control; belief that outcomes depend on one's own actions rather than fate, chance, or others. Linked to enterprise, taking charge, follow-through, determination, and leadership.
Confidence	Beliefs and feelings about one's abilities, a realistic self-concept, and self-esteem.
Ethics	Strength of character, social responsibility, and principled behavior, including being honest and fair, following rules, following through on actions, and behaving responsibly.

Source: Guerra, Modecki, and Cunningham (2014)

We recommend that Christian NGOs desiring to implement SEL programs be explicit in terms of which dimensions and skills they want to focus on. Furthermore, having measures of the socio-emotional skill that one focuses on will aid in ultimately measuring and determining progress and impact for that particular area.¹⁷

An example of an intervention that was focused on a particular socioemotional skill was a curriculum focused on developing students' grit¹⁸ in Turkey (Glewwe et al. 2022). It

¹⁷ While it is beyond the scope of this paper to recommend particular instruments, we compiled a list of commonly used validated instruments in Appendix 3.

¹⁸ Defined as perseverance in a productive task. Developing grit influences the motivation to

increased math scores by 0.28 SD and Turkish scores by 0.13 SD. The curriculum uses animated videos, mini-case studies, and classroom activities to highlight: (1) the plasticity of the human brain, challenging the notion of fixed abilities; (2) the critical role of effort in skill development and goal achievement; (3) the constructive interpretation of failure; and (4) the importance of goal setting. Given that “gritty” behavior is influenced by beliefs, this approach focused on influencing student’s beliefs about effort, success and failure—such as their perceptions about returns to exercising effort.

Another element that is relevant for designing and implementing effective education interventions is understanding the neurobiology of learning. Taking neurobiology into account may help Christian NGOs to choose interventions that are compatible with the process of skill acquisition and brain development, which happens in a sequential, cumulative, interdependent way (“skills beget skills”). One implication of this is that socio-emotional development is interdependent with cognitive, physical and sensory-motor development (Cunningham et al. 2016; Puerta et al. 2016; World Bank 2018).

There are critical periods when the brain is most malleable—and thus, when interventions are potentially more cost-effective.

Overall, middle childhood (ages 6-11) is considered to be the optimal time frame for most socio-emotional skills to be acquired. While the foundation can be laid for some skills in early childhood and they can continue to be reinforced in the teenage years and into adulthood, socio-emotional learning that takes place in middle childhood has the greatest evidence of effectiveness (Cunningham et al. 2016; World Bank 2018). Table 15 summarizes these findings.

establish a goal, to exert effort towards that goal and to persevere in pursuing it in response to negative performance feedback (Alan et al. 2016).

Table 15. Optimal stages of development of PRACTICE skills

Dimension of socio-emotional skills	PRACTICE taxonomy of socio-emotional skills	Subskills	Stage of development of key actors			
			Age: 0-5 (parents)	Age: 6-11 (parents, school)	Age: 12-18 (school, peers)	Age: 19-29 (school, workplace, family)
Achieving goals	Achievement motivation	Mastery orientation Sense of purpose Motivation to learn		Optimal	Reinforcement	
	Ethics	Honesty Fairness orientation Moral reasoning	Foundational	Optimal	Optimal	
	Initiative	Agency Internal locus of control Leadership	Optimal	Optimal	Optimal	Optimal
	Problem-solving	Social-information processing skills Decision making Planning skills	Foundational	Optimal	Optimal	Reinforcement
Working with others	Teamwork	Empathy/prosocial behavior Low aggression Communication skills Relationship skills	Optimal	Optimal	Reinforcement	
Managing emotions	Confidence	Self-efficacy Self-esteem Positive identity	Foundational	Optimal	Optimal	Reinforcement
	Control	Delay of gratification Impulse control Attentional focus Self-management	Optimal	Optimal	Optimal	Reinforcement
	Resilience	Stress resistance Perseverance Optimism Adaptability	Optimal	Optimal	Reinforcement	

Source: Guerra, Modecki, and Cunningham (2014)

Note: “Foundational” refers to the basis for the core skill building that takes place in a subsequent period. “Optimal” refers to periods of maximum sensitivity when it is easiest for individuals to acquire specific skills. “Reinforcement” means that intense practice is needed for the skills to be mastered.

In the following paragraphs, we will present the different settings Christian NGOs may be interested in implementing socio-emotional learning methodologies, across stages of development.

The first potential setting is in early childhood development programs for infants and young children. One example of an early childhood development program was an intervention in Ghana that trained volunteer mothers and kindergarten teachers in stimulation and play curriculum, which increased kindergarten children's cognitive and socio-emotional skills (Evans and Mendez Acosta 2021). An example of an early childhood development program implemented by a Christian NGO was the Jumpstart program. Bloem and Wydick (2023) found that socioemotional skills partially mediated the effectiveness of this Christian kindergarten program in the Philippines run by International Care Ministries (ICM).

In the Jumpstart program, a local Protestant pastor plays a key role in the establishment of the kindergarten, and teachers who apply to the program submit a referral letter from their local pastors. The program was designed to be aligned with ICM's faith values—its biblical basis comes from Jeremiah 29:11: “For I know the plans I have for you,” declares the Lord, ‘plans to prosper you and not to harm you, plans to give you hope and a future.’” It includes medical checkups, lunch and a snack at school, free school supplies, and a caregiver support component: credit services, house visits, and livelihood training.

The study showed that children who attended Jumpstart developed higher levels of grit, self-control, and self-identity compared to those that did not attend kindergarten. They also scored higher in conscientiousness and openness to new experiences, as measured by the Big 5 personality traits. Conversely, children who attended the regular government kindergarten had increased peer affiliation and self-control, but showed no improvement in grit and self-identity compared to children that did not attend any

kindergarten. Of the Big 5 personality traits, they had higher levels only for agreeableness. The authors conclude that socio-emotional skills, in part, explain the higher academic performance in elementary school and higher current school enrollment of children that attended Jumpstart, relative to their siblings and relative to children who attended the government kindergarten.

For school-aged children, there are several different types of SEL interventions, delivered both in school and outside of the school setting. Cunningham et al. (2016) and Puerta et al. (2016) identified four different ways to include SEL in schools: (i) developing the teacher's socio-emotional skills, (ii) improving the school climate, (iii) incorporating the development of socio-emotional skills into the teaching of other subjects, and (iv) implementing a socio-emotional curriculum. Outside of the school setting, SEL has been delivered through different after-school programs, such as theme-based clubs or mentoring groups. Below we provide a brief description of each of these five ways of delivering SEL in and out of school and discuss the evidence on their effectiveness.

School-based SEL that focuses on teachers has little empirical evidence on its effectiveness. The theory for that approach is that increasing teachers' socio-emotional skills would have a positive effect on students' socio-emotional skills.

Improving the school climate includes setting and communicating clear behavioral expectations to students and staff: rewards for appropriate behavior and consequences for problem behavior that are consistently applied. The School-Wide Positive Behavior Support (SWPBS) is an example of such a model. Randomized controlled trials have shown that SWPBS "decreased disciplinary problems and increased third-grade reading

performance” (Cunningham et al. 2016, 51) in Illinois and Hawaii. More evidence is needed for interventions in developing countries.

The third approach includes active learning, working in groups, project-based problem solving and exploration in order to develop teamwork, problem solving, confidence and motivation. The Incredible Years program is an example of this type of approach. It consists of 20-30 minutes lessons designed for elementary school (and younger) children and their parents that provides information on and practice in seven areas: “learning school rules; how to be successful in school; emotional literacy, empathy, and perspective-taking; interpersonal problem solving; anger management; social skills; and communication skills” (Cunningham et al. 2016, 53). An RCT conducted in the United States revealed that “program participants were significantly more likely than controls to display emotional self-regulation and social competence; they also had fewer conduct problems and engaged in less off-task behavior” (Cunningham et al. 2016, 53). However, to our knowledge, no evaluation has been implemented in the context of a developing country.

The fourth is the closest to the teaching of a regular subject. An example of SEL incorporated in the school curriculum was an intervention in China for secondary students in rural areas. The goal was to reduce students’ anxiety by teaching skills such as goal-setting, emotion management, and self-awareness. The program provided 32 fully-scripted, 45-minute sessions of SEL curriculum for teachers, with five days of teacher training. It was successful in reducing dropout rates by 1.6 percentage points at midline (8 months). At endline (15 months), there was an effect for students who were already at higher risk of dropping out (older students and students with friends who have

already dropped out), but the effect faded out for other students. A likely explanation for the reduced impact over time is that these other students lost interest in the program (Akyeampong et al. 2023; Glewwe et al. 2020; 2022).

According to Puerta et al. (2016) effectiveness of some programs, such as the ones addressing bullying, might depend on the incorporation of school-wide or community-wide components. That is, if a socio-emotional skill is taught to individuals but the social environment does not support or reinforce it, the “peer pressure” will likely suffocate that new desired positive behavior.

A type of an after-school intervention is the support offered by children who are part of a child sponsorship program, such as the Christian NGO Compassion International.

Besides direct support for schooling and medical care, the intervention also has aspects that may contribute to socio-emotional learning by having the following fundamental elements of Positive Youth Development (PYD) programs (Sim et al. 2024):

1. Positive and sustained adult-youth relationships, which are relationships between a young person and an adult who is competent, caring, and continually available for at least a year. This is typically a mentor, coach, or teacher;
2. Life-skill-building activities, that is, activities that enhance skills pertinent to goal selection, goal optimization (using resources effectively to meet goals) and compensation (reassessing in the face of blocked goals);
3. Opportunities for youth participation in, and leadership of, valued family, school, and community activities.

Glewwe et al. (2018) find that participation in Compassion’s program “significantly raises sponsored children’s levels of happiness (0.42 SD), self-efficacy (0.29 SD), and hope (0.66 SD).” This is in addition to the program’s educational impacts, namely: “increas[ing] years of completed schooling by 1.03–1.46 years over a baseline of 10.19 years and increas[ing] the probability of primary school completion by 4.0–7.7 percentage points (baseline 88.7 percent), secondary school completion by 11.6–16.5 percentage points (baseline 44.9 percent), and university completion by 2.1–2.4 percentage points (baseline 4.3 percent)” (Wydick et al. 2013).

Other types of SEL after-school interventions include combinations of vocational training and socio-emotional skills for youth. These studies show mixed results. Galpão Aplauso in Brazil increased employment and earnings, but “found no significant effects on grit, on participants’ score on the competencies covered by the Social and Personal Competencies Scale, on their social activities, or on risky behavior” (Puerta et al. 2016). While Galpão Aplauso had an effect on economic outcome and no effect on socio-emotional skills, there are two other studies that show a positive effect on socio-emotional outcomes with no effect on economic outcomes. The Juventud y Empleo Program in the Dominican Republic increased socioemotional skills for youth ages 16-29, aspirations, conflict resolution skills, leadership, self-esteem, and order and self-organization. Despite having a strong short-term effect for women, this effect dissipated in the long run. “The program’s impact on risky behavior [for women] was mixed, with a decline in pregnancy but an increase in smoking” (Cunningham et al. 2016). The “Sustainable Transformation of Youth” program in Liberia included 8 weeks of Cognitive-Behavioral Therapy sessions developing self-control, self-esteem, regulation of antisocial behavior, and a growth mindset. The intervention had positive effects on

socio-emotional outcomes and decreased crime and violent behavior but had no effect on economic outcomes (employment or earnings) (Cunningham et al. 2016).

Therefore, not all SEL programs are successful. Some SEL programs can actually lead to negative effects, as was the case with the Cambridge-Somerville Program (United States), a program targeting 13-year olds with behavioral problems by providing medical assistance, tutoring, summer camps, and parent–teacher meetings. A 30-year follow-up showed that participants in the treatment group had increased drinking habits, serious mental illness, heart problems, blood pressure, crime rates, and mortality rates when compared with the control group (Kautz et al. 2014; McCord 1978, as cited in Puerta et al. 2016). McCord (1978) interpreted that the failure to create a sense of autonomy among participants could have been the reason for its negative outcomes.

It is important to note that participant age and intervention setting are not the only factors that should be taken into consideration in the acquisition of socio-emotional skills. Other factors, including stress and environmental inputs, should also be considered. Neural connections (synapses) can be reinforced by environmental inputs, such as caregivers' or teachers' stimulation. Therefore, environmental inputs can determine which of these synapses will survive over the life cycle (World Bank 2018). Experiences trigger hormonal responses that affect the architecture of the brain. For example, when the brain encounters novelty through a stimulating classroom activity that fosters exploration, dopamine is triggered, stimulating information absorption, characterizing effective learning (World Bank 2018).

On the other hand, situations of intense stress or sustained negative emotions (e.g. crises, acute deprivation, neglect and violence) trigger hormones, such as cortisol, that

interfere with the brain's ability to learn, retain and use information. Cumulative exposure to risk factors can either eliminate synapses associated with healthy brain development or reinforce those associated with unhealthy brain development (World Bank 2018).

Therefore, some interventions in the area of socio-emotional learning are focused on sheltering children from stress factors. Two examples of interventions that work through this mechanism are mentoring relationships and fostering safe spaces. There is a large body of evidence that focuses on the provision of safe space for girls in developing countries (Akyeampong et al. 2023; Cunningham et al. 2016; Evans and Yuan 2022; Psaki et al. 2022; Puerta et al. 2016). The specific content varies from program to program, but may include learning life skills, discussing sexual and reproductive health, and doing homework. In Liberia, for example, a mentoring program for girls that intended to develop socio-emotional skills increased primary school completion and the transition to secondary school. Programs in Zambia, Uganda and India increased school enrollment rates and aspirations for future labor market participation for girls, but most of them did not increase test scores (Akyeampong et al. 2023). Bashir et al. (2018), which suggests that more research is needed to disentangle the effect of safe spaces for girls on their own from the effect of the curriculum (e.g. negotiation skills) provided alongside the safe spaces.

The limited existing evidence suggests that Christian programs can be effective in developing socio-emotional skills, even when they were not labeled as SEL. This may be explained by the fact that Christian virtues are highly valued in the implementation of these programs. Thus, there is fertile ground for more research in this context. Overall, the formation of socio-emotional skills should start as early as possible, with the age

range 6-11 years old considered optimal for developing any and all types of socio-emotional skills, according to Table 14. This may be surprising for some. However, that does not mean that investments in other age groups are not needed or are not effective. There are several studies that indicate investments in early childhood programs and after-school programs are promising. Finally, when seeking to develop socio-emotional skills, we recommend that Christian NGOs' programs be sequenced, active, focused, and explicit (SAFE).

Table 16 summarizes the findings from this section.

Table 16. Summary of SEL Findings

I. Effective or promising SEL

1. Effective SEL programs were typically characterized by four elements: Sequenced (follows a progression), Active (participatory), Focused (sufficient time) and Explicit (naming which of the many types of socio-emotional skills that the program seeks to develop).
 2. Due to the cumulative nature of skills ("skills beget skills"), the earlier the better. Early Childhood is considered either optimal or foundational period for most types of socio-emotional skills—all except the skills of Achievement Motivation (in the PRACTICE framework from Table 15). Thus, investments in Early Childhood Development Programs are consistently effective.
 3. Programs implemented between 6-11 years of age are optimal for developing most types of socio-emotional skills. Note that this does not mean that development of socio-emotional skills is not effective in other age groups or is not important. Investments in Early Childhood Development Programs are in fact some of the more consistently effective investments.
 4. Sheltering children from stress factors, such as providing safe spaces. Interventions that combined safe spaces for teenage girls with life skills training have been effective in improving outcomes such as enrollment rates and aspirations for future labor market participation for girls, but note that most of them did not increase test scores.
 5. Integration of Christian virtues approach: Evidence suggests Christian programs can be effective in developing socio-emotional skills even when not explicitly labeled as SEL.
-

II. Ineffective SEL

1. Failing to create a sense of autonomy among participants could have been a driver of the negative effects in a 5-year intervention that sought to decrease criminal behavior among youth. The Cambridge-Somerville Program (United States), which targeted 13-year-olds with behavioral problems, had negative effects on its participants: increasing drinking habits, serious mental illness, heart problems, blood pressure, crime rates, and mortality rates measured by a 30-year follow up.
2. Lack of school-wide or community-wide components to address issues such as bullying. In these cases, focusing only on one age group or class may be ineffective as “peer pressure” is an important element to consider, as students observe the norms around them.

III. Inconclusive Findings

1. School-based SEL programs that focus on training teachers' socio-emotional skills have little empirical evidence of their effectiveness.
2. More research is needed to determine the effectiveness of safe spaces for girls on their own, separate from the effect of the life skills curriculum provided alongside them. Some did not affect learning outcomes in the period evaluated, but increased school enrollment rates and aspirations for future labor market participation for girls.
3. More evidence is needed for evaluating the effectiveness of interventions designed to improve the school climate and interventions that incorporate the development of socio-emotional skills into the teaching of other subjects, specifically in developing contexts. Studies to date were done only in the context of developed countries.

IV. Other Recommendations

1. There are multiple approaches for developing different socio-emotional skills. Christian NGOs would benefit from familiarizing themselves with different options and consider what may be better suited for their contexts and situations.
2. Children and youth that are exposed to risk factors, experience situations of intense stress or sustained negative emotions (e.g. crises, acute deprivation, neglect and violence) are in particular need of SEL interventions.
3. There is suggestive evidence that SEL delivered through a structured socio-emotional curriculum that is similar to the teaching of a regular subject may lose its effectiveness in the long run when students lose interest in the program. Therefore, practitioners could consider assessing engagement over time, and optimal duration that addresses the need.

Source: Authors

F. Reading Materials Designed for Local Community

Sixty-four percent (18/28) of the Christian NGOs that responded to our survey are already implementing some type of reading materials designed for the local community. Twenty-eight percent (9/32) of respondents to our survey wanted to see this topic reviewed or evaluated, which was tied for the fifth highest total.

While our survey of Christian development practitioners asked whether their organizations provided “reading materials designed for the local community,” most of the literature that we reviewed discussed the effectiveness of “mother tongue instruction” or “local language instruction” more broadly. These terms cover more activities than simply designing and providing reading materials; for example, they include training teachers in mother tongue instruction, providing information to parents about the benefits of learning in the mother tongue, and developing and implementing appropriate and consistent language policies. In this section, we review the literature on mother tongue instruction rather than simply the development and provision of reading materials for the local community. We begin by examining the evidence about mother tongue instruction in the early grades (e.g., through grade six),¹⁹ after which we discuss mother tongue literacy for adults.

Most of the literature reviews that we considered did not mention mother tongue instruction at all. Indeed, one review specifically noted the paucity of rigorous evaluations of mother tongue instruction and called for more studies designed to test its effectiveness (Conn 2017). Only four of the 29 literature reviews that we examined considered mother tongue instruction, all of which were in the early grades. All four

¹⁹ Research about mother tongue instruction is often focused on the early grades because most language policies gradually transition students to a national language for secondary education.

studies found that it increased several student outcomes, including the rate at which students learn to read, their reading comprehension, average reading achievement scores, attendance and persistence, ability to learn a second language, and long-term educational attainment and civic engagement, as shown in Table 17.

Table 17. Learning outcomes that mother tongue instruction in the early grades has increased

Learning Outcome	Country	Source
Rate at which students learn to read	Cameroon, Kenya, and Uganda	Evans and Mendez Acosta (2021)
Reading comprehension	Kenya, Ethiopia, and Tanzania	Bashir et al. (2018); Evans et al. (2023); World Bank (2018)
Average reading achievement scores	49 countries	Bashir et al. (2018)
Attendance and persistence	26 countries	World Bank (2018)
Ability to learn a second language	Cameroon and Ethiopia	Evans and Mendez Acosta (2021)
	Philippines and Malawi	World Bank (2018)
	South Africa	Evans and Mendez Acosta (2021); World Bank (2018)

Long-term educational attainment and civic engagement	Ethiopia	Evans and Mendez Acosta (2021)
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Source: Authors

The above results may be somewhat surprising, especially for parents, who might assume that immersion in a dominant language as early as possible will give their children the biggest advantages in education and the workforce.

On a less positive note, at least one study in Kenya found that mother tongue instruction did not affect English scores and led to worse mathematics scores for students who were taught in a mother tongue, compared with those who were not (Piper et al. 2018, as cited in Evans and Mendez Acosta 2021). Additionally, in some contexts with high levels of linguistic diversity, classrooms may be divided by mother tongue, which can be functionally equivalent to segregation (World Bank 2018). In fact, as was the case with Bosnia and Herzegovina in the 1990s, some governments have enforced the right to “own” language instruction to intentionally segregate certain populations (World Bank 2018).

Despite the fact most of the evidence supports mother tongue instruction, there are many barriers to its implementation, which must be addressed for it to be effective. First, teachers must be trained in mother tongue instruction (Bashir et al. 2018). Second, high-quality textbooks and other materials need to be developed in the mother tongue across enough genres and levels for effective classroom use. Third, parents should receive information about the benefits of mother tongue instruction in the early grades—as they often favor education in more practical languages as early as possible in order to prepare their children for the labor market (Evans and Mendez Acosta 2021; World Bank

2018). Finally, mother tongue instruction policies need to be developed that determine both the age at which students will transition to a national language (it likely needs to be after grade six to give students time to transition from “learning to read” to “reading to learn”)²⁰ and how many languages will be covered by the policy (Bashir et al. 2018). Countries with many local languages may have to weigh the cost and benefits of investing heavily in mother-tongue materials and teacher training in many different languages, versus investing in other means of improving the quality of education more generally (World Bank 2018).

Local language policies not only need to be developed, but also to be implemented *consistently*, if they are to improve student outcomes. For example, Ethiopia and Tanzania both have consistent implementation of local language policies, and at least 50 percent of children in those countries scored greater than zero in reading comprehension on Early Grade Reading Assessments (EGRA);²¹ likewise, in Burundi, which also has consistent implementation of local language policies, 40 percent of children scored greater than zero (Bashir et al. 2018). By contrast, in Ghana, Mali, and Zambia, none of which implements local language well in the early grades, 70-90 percent of children were unable to answer even one question correctly on the EGRA reading comprehension test (Bashir et al. 2018). Finally, Kenya represents a context in which local language policies are implemented inconsistently (e.g. the policy says local language should be used in the early grades, but in practice English is used) (Piper et al.

²⁰ For more information and recommendations about transitioning to a national language or other language of wider communication, refer to both the published (Inyega et al. 2025; Manuel et al. 2025) and forthcoming LITES multi-country studies: <https://pulte.nd.edu/projects/lites.html>.

²¹ EGRA assesses primary students’ progress toward learning to read by testing their skills in various pre-reading and reading subtasks, such as letter names, letter sounds, reading fluency, and reading comprehension. More information can be found at <https://earlygradereadingbarometer.org/resources/egra>.

2016, as cited in Bashir et al. 2018). Two thousand grade three students' EGRA scores in Kenya found that while students had greater decoding ability and reading fluency in English, they still had better reading comprehension in their mother tongue—despite receiving less instructional time in their mother tongue (Piper et al. 2016, as cited in Bashir et al. 2018). Overall, the evidence is strong that local language policies should be implemented consistently in the early grades to help students comprehend what they read.

While the evidence for mother tongue instruction in the early grades is strong, very little research has been done on the effectiveness of mother tongue instruction for adults. This lack of data may be a result of past assumptions about adults' inability to learn complex skills or about the expected higher returns to investments in children's education. Either way, none of the original reviews mentioned mother tongue literacy for adults. We found only one other very recent literature review that specifically addressed adult literacy with most, but not all, of these interventions in the participants' mother tongue (Aker et al. 2024). Given that adult mother tongue literacy interventions are commonly implemented by Christian NGOs that work in Bible translation (see, for example, Okada da Silva et al. 2024), we decided to include this additional literature review.

Most of the studies cited in this review were from Africa and South Asia (Aker et al. 2024). In such contexts, adult literacy programs tend to focus on basic reading, writing, and math, and are usually offered in students' mother tongue. They typically last 4-9 months meeting 5-6 times per week for 2-3 hours a day with breaks during peak agricultural seasons. The primary focus of these programs is decoding skills (i.e.

identifying letters and mapping sounds) with little focus on automaticity (i.e. ability to recognize words quickly without conscious effort) and reading comprehension. Most programs do not explicitly help adults transfer these skills to their daily lives (Aker et al. 2024).

This transfer of skills is particularly important as adults face unique barriers to learning, such as decreased brain plasticity, higher opportunity costs (i.e. more activities they must give up to engage in literacy activities), increased stressors (i.e. family and work responsibilities), and shorter time horizon to see benefits of literacy relative to children. As such, adults often need to see immediate benefits to their learning outside the classroom to stay motivated and persist.

Recent experimental studies find that adult literacy programs have positive impacts on math and reading skills, with stronger impacts on math skills (Aker et al. 2024). The reading effects are small (0.07-0.12 SD) and are concentrated in decoding, not comprehension. Mobile phones provide a strong motivation for adults to acquire reading skills and apply the skills learned in the classroom in their daily lives. Incorporating the use of cell phones in adult literacy instruction has been shown to increase writing and math skills by 0.18-0.25 SD with results persisting up to two years later (Aker et al. 2024).

Adult education programs have impacts beyond learning as well. Studies show that adult education has increased consumption by 5%; has increased savings, ownership of durable assets, and food security; and has contributed to higher self-esteem and involvement in children's education (Aker et al. 2024). Studies to date do not find measurable impacts on income or women's empowerment, however (Aker et al. 2024).

These positive impacts of adult literacy education may come as a surprise given that adults struggle with more complex tasks like learning to read and are often assumed to be less likely to benefit from such programs.

Based on these findings, Aker et al. (2024) recommend that adult literacy programs allow sufficient time for each stage of literacy acquisition (decoding, automaticity, and reading comprehension). The length of time needed for adults to acquire fluency at each stage is often much longer than the length of time children need. Additionally, more instructional time is needed for languages that are not phonetic (i.e. do not have a one-to-one correspondence between letters and sounds) or that use an unfamiliar alphabet (Aker et al. 2024). Pedagogical strategies should be tailored to adult learners' characteristics, allowing them to identify their own educational needs, to engage in techniques like group discussion that reinforce concepts, and to implement their newly acquired skills to solve immediate problems in their daily lives (Aker et al. 2024). Exercises should use practical applications and should be repeated many more times than they would be for children given the adult brain's reduced plasticity.

Overall, mother tongue instruction for both children and adults has been found to be effective for increasing several outcomes. A summary of the impacts of mother tongue instruction for both children and adults can be found in Table 18.

Table 18. Summary of findings on mother tongue instruction (MTI) interventions

Student	Outcomes Increased by MTI Interventions	Needed for Effective Implementation
<i>Children</i>	<ul style="list-style-type: none"> ● Rate at which students learn to read 	<ul style="list-style-type: none"> ● Teacher training ● Textbook creation

	<ul style="list-style-type: none"> • Reading comprehension • Average reading achievement scores • Attendance and persistence • Ability to learn a second language • Long-term educational attainment and civic engagement 	<ul style="list-style-type: none"> and provision • Mother tongue and multilingual education policy development • Mother tongue and multilingual education policy implementation
<i>Adults</i>	<ul style="list-style-type: none"> • Math and reading skills, with stronger impacts on math skills • Writing and math skills with use of cell phones in literacy class • Consumption • Savings • Ownership of durable assets • Food security • Self-esteem • Involvement in their children's education 	<ul style="list-style-type: none"> • Plenty of instructional time to practice skills • Application to daily lives (perhaps through use of cell phones) • Identification of students' specific educational needs • Techniques tailored to adult education, e.g. group discussion

Source: For sources of information about children see Table 9 above. For adults, see Aker et al. (2024).

Effective implementation of such programs will look different depending on the age of the student. For children, many school-level and policy-level steps need to be taken to facilitate effective mother tongue instruction. For example, teachers need to be trained, textbooks need to be designed, and policies need to be drafted and implemented consistently. For adults, literacy programs need to focus on providing plenty of time for

students to practice the skills they are learning and to apply these skills to their daily lives (perhaps with cell phones). These results and recommendations are summarized in Table 19.

Table 19. Summary of mother tongue literacy recommendations

<p>I. Effective Mother Tongue Literacy Practices</p> <ol style="list-style-type: none">1. Mother tongue instruction in the early grades improves the rate at which students learn to read, their reading comprehension, average reading achievement scores, attendance, and persistence, ability to learn a second language, and long-term educational attainment and civic engagement.2. Teachers should be trained specifically in mother tongue instruction.3. High-quality textbooks and other materials in the mother tongue (across enough genres and levels for effective classroom use) should be provided.4. Policymakers should make decisions regarding the age at which students will transition to a national language (usually this is grade 6 after students transition from “learning to read” to “reading to learn”) and how many languages will be covered by the policy.5. Literacy lessons for adults should focus on helping them transfer literacy skills to their daily lives (perhaps through cell phones).6. Adults should be allowed to identify their own educational needs, engage in group discussion, and repeat practice exercises many times.
<hr/> <p>II. Ineffective Mother Tongue Literacy Practices</p> <ol style="list-style-type: none">1. Providing instruction in the mother tongue should not be used as a tool for intentional segregation of specific populations.2. Mother tongue instruction policies that are implemented inconsistently (e.g. the policy says mother tongue should be used for instruction, but in practice English is used) are ineffective.3. Literacy lessons for adults that do not help them apply literacy skills to their daily lives may not be well-attended (i.e. the opportunity cost of attending may seem too high if they cannot see the relevance) and consequently are likely to be ineffective.4. Literacy lessons for adults that do not provide sufficient time for them to practice newly acquired skills (including decoding, automaticity, and reading comprehension) may be ineffective.

III. Inconclusive Findings

1. It is not clear why so little research has been done on adult mother tongue instruction—it may be because of assumptions about adults' inability to learn complex skills or about the expected higher returns to investments in children's education.

IV. Other Recommendations

1. Parents should be provided with information about the benefits of mother tongue instruction in the early grades (without such information they may assume that learning a national language as early as possible is best).
2. Ideally, students should transition to a national language after they have transitioned from “learning to read” to “reading to learn” (around grade 6).

Source: Authors

G. Education in Emergencies

The literature that we reviewed on education in emergencies sub-divided emergencies that affect education into three categories: disasters, public health crises, and wars/conflicts. Much of the literature focuses on the *effects of the emergencies* on educational outcomes rather than the *effects of the emergency interventions* on educational outcomes. We do review a handful of emergency interventions mentioned in the literature at the end of this section, however. Given the lag between when a study first appears and when it is included in a literature review, most Covid-19 interventions were too recent to have been included in the literature reviews on which this paper is based.²²

Half (16/32) of the respondents to our survey are already implementing some type of education-in-emergency intervention. Twenty-eight percent (9/32) of the Christian NGOs that responded to our survey wanted to see this topic reviewed or evaluated, which was

²² Angrist et al. (2023) provide an early, informal review of a learning intervention applied in five countries during the Covid-19 pandemic.

tied for the fifth highest total alongside both provision of educational supplies and curriculum development.

Five of the 29 articles we reviewed discussed education in emergencies. One of the five was an unpublished manuscript entirely focused on summarizing articles about the effects of emergencies on educational outcomes. We included those findings here as a means of laying the groundwork for what educational interventions are most necessary in the context of emergencies. Throughout this section, we cite any papers included in this unpublished manuscript by citing the primary source. We also included findings from an additional article written by one of us (Glewwe) about the effects of an EdTech intervention implemented in Bangladesh during the Covid-19 pandemic.

Unsurprisingly, most of the effects of emergencies on educational outcomes are negative. Disasters lower educational attainment (Bashir et al. 2018; Deuchert and Felfe 2015) and test scores (Andrabi et al. 2023; Deuchert and Felfe 2015). They also increase the prevalence of grade repetition (Deuchert and Felfe 2015). One silver lining of disasters, however, is that occasionally they improve educational outcomes by causing displacement from low-performing schools to higher-performing ones (Sacerdote 2012). A primary mechanism by which disasters affect educational outcomes is through the loss of wealth, which causes a shift of family resources from education to other needs (Deuchert and Felfe 2015; Hallegatte et al. 2020). This loss of wealth disproportionately affects the poor who are more vulnerable and have less socio-economic resilience to disasters (Hallegatte et al. 2020).

Public health crises likewise have negative effects on educational outcomes such as enrollment, learning, and attainment. Lockdowns during health crises generally cause

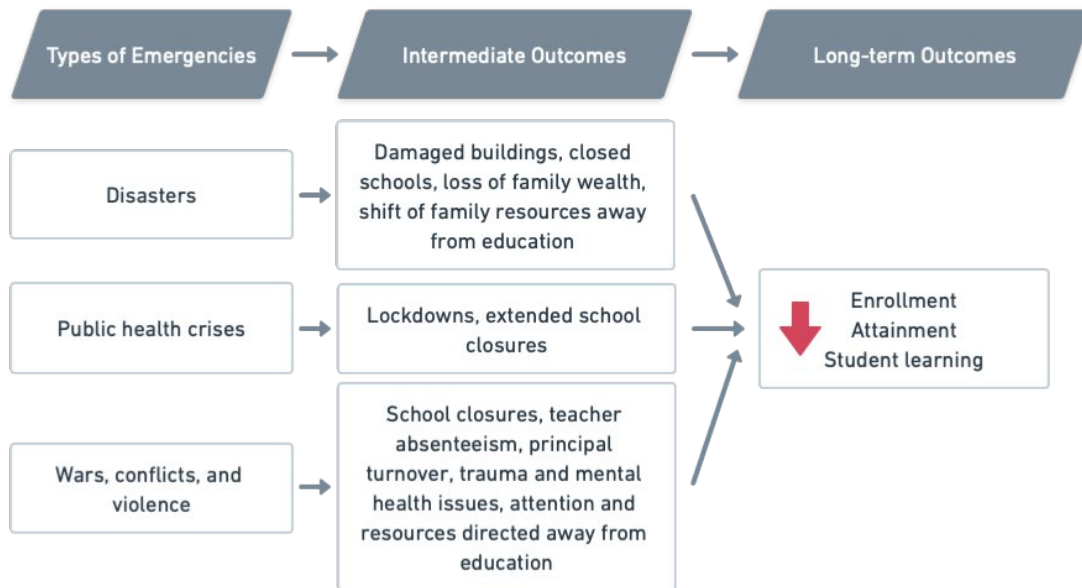
learning loss (Moscoviz and Evans 2022) and decrease educational attainment (Dessy et al. 2021; Makino et al. 2021; Meyers and Thomasson 2017; Moscoviz and Evans 2022). Lockdowns specifically decrease the return-to-school rate for older children who are past the compulsory age (Dessy et al. 2021; Makino et al. 2021; Meyers and Thomasson 2017; Moscoviz and Evans 2022). Extended school closure for children of legal working-age often results in their joining the labor force (Meyers and Thomasson 2017). Lockdowns can also increase marriage or engagement for older girls (Dessy et al. 2021; Makino et al. 2021; Moscoviz and Evans 2022).

Wars, conflicts, and violence also negatively affect educational outcomes such as enrollment, test scores, and attainment. Children in conflict-affected countries are much more likely to be out of school than those in non-conflict countries (Bertoni et al. 2019; Bharati 2022; Krishnaratne et al. 2014; Weldeegzie 2017; World Bank 2018). Children living in contexts affected by conflict make up about one-fifth of the world's primary school-age population; however, they comprise 50 percent of those who are out of school (World Bank 2018). Primary education is accessible to only one half of all refugee children, and refugee children are five times more likely to be out of school than other children (World Bank 2018). For those students who are enrolled and remain enrolled during a conflict, test scores (especially in math) decline (Miaari and Lee 2024; Monteiro and Rocha 2017; World Bank 2018), and the same is true for literacy rates (Bharati 2022; Weldeegzie 2017; World Bank 2018). The number of grades completed is also lower in conflict-affected countries (Akbulut-Yuksel 2014; Akresh et al. 2012; Brück et al. 2019; Dabalen and Paul 2014; Weldeegzie 2017; World Bank 2018). Children living in areas of conflict are 30 percent less likely to complete primary school and 50 percent less likely to complete lower secondary (World Bank 2018). Studies on the long-run

effects of conflict have even shown that negative educational outcomes such as lower educational attainment can be passed down to the children of those who experienced the conflict (Weldeegzie 2017).

There are several mechanisms by which conflict negatively affects children's educational outcomes. Learning can be directly affected when schools are the target of the violence; however, most often conflict affects learning indirectly through a lack of teachers and resources and through trauma (World Bank 2018). Security issues often direct attention and resources away from schools, and external aid organizations often find it hard to deliver materials to areas of conflict (Miaari and Lee 2024; World Bank 2018). Lack of funding and payment delays can cause interruptions to teachers' pay, which can lead to less qualified or uncertified teachers replacing trained teachers (World Bank 2018). Conflict can also effectively decrease the supply of schools by increasing teacher absenteeism, school closings, and principal turnover (Miaari and Lee 2024; Monteiro and Rocha 2017). Trauma is another mechanism by which children's education is negatively impacted. Conflict often worsens discrimination based on religion, ethnicity, and gender (World Bank 2018), and early-life exposure to war leads to a higher incidence of severe mental health issues (Singhal 2019), which leads to lower quality of learning (Brück et al. 2019).

Figure 6. Types of education emergencies and their intermediate and long-term outcomes



Made with Whimsical

Source: Authors

While one would expect most emergencies to have negative effects on children’s education, it is less clear what can be done to reduce these effects. Emergency education interventions typically address the three main outcomes that are negatively affected by education emergencies: enrollment, attainment, and quality of learning (as shown in Figure 6). To maintain students’ connection to school during lockdowns due to wars or epidemics, technology can help (World Bank 2018). For example, during the 2014-2015 Ebola outbreak in Sierra Leone, the government provided education lessons over the radio for 30-minutes a day (World Bank 2018). While results of this intervention were not provided in the World Bank (2018) report, another technology-based intervention in Botswana during the Covid-19 pandemic did find that 15-20 minute

weekly phone calls and SMS messages increased grade 3-5 students' test scores in math by a moderate 0.12 SD of the distribution of those scores (Rodriguez-Segura 2022). Girls' clubs in Sierra Leone during the same 2014-2015 Ebola outbreak provided vocational and reproductive education and shielded participants from negative effects of the outbreak, such as increased dropout and adolescent pregnancy (Bandiera et al. 2019). For students who were early leavers, second-chance programs are in high demand and seem to be a promising means of increasing attainment rates (World Bank 2018). (Re-)instituting universal primary education after wars, epidemics, or natural disasters can also significantly reduce long-term effects on attainment. For example, after the Nigerian Civil War, children of women who were adolescents during the war, completed 0.6 fewer years of schooling than their peers (Akresh et al. 2023). In states where universal primary education was implemented, however, these effects were reduced by two-thirds (Akresh et al. 2023).

The quality of learning can also be addressed by emergency education interventions. During crises, technology can facilitate student learning. For example, the "Can't Wait to Learn" program in Sudan provided tablets with educational games to out-of-school students and led to an increase in their math scores (World Bank 2018). A comparable program in Bangladesh implemented during the Covid-19 pandemic yielded similar results with a 0.25 SD increase in numeracy and 0.17 SD increase in literacy (Glewwe et al. 2024). Partnerships between parents and schools can also raise learning in fragile contexts. Building community-based schools in Afghanistan decreased the distance to schools, increased enrollment rates, and increased learning outcomes, especially for girls (World Bank 2018). After disasters, investments in infrastructure can increase student learning. For example, in Italy after an earthquake in 2012, funding that provided

schools with 100 euros per student for infrastructure improvements increased average test scores by 4.6% in math and 1.2% in Italian (Belmonte et al. 2020).²³ Trauma-informed curricula can also positively affect learning after crises. A randomized controlled trial in the Democratic Republic of the Congo demonstrated that the “Learning to Read in a Healing Classroom” program, which provided conflict-affected students reading and math curriculum with social-emotional learning principles to increase their wellbeing and security, led to marginally significant impacts (10% significance level) on test scores in reading and geometry, but no impacts on test scores in addition and subtraction (Aber et al. 2017).

Table 20 summarizes the results of the ten studies described above, listing the outcome targeted, the intervention implemented, the context, and the results.

Table 20. Summary of emergency education interventions and their results

Outcome Targeted	Intervention	Context	Results
<i>Enrollment</i>	30-minute radio lessons	Sierra Leone, 2014-2015 Ebola outbreak	No results provided (World Bank 2018)
	Girl’s clubs with vocational and reproductive education	Sierra Leone, 2014-2015 Ebola outbreak	Participants shielded from increased dropout and adolescent pregnancy (Bandiera et al. 2019)
	Building community-based schools	Afghanistan, northwestern province affected by tribal conflict more than war	Decreased distance to schools, increased enrollment rates, and increased learning outcomes especially for girls (World Bank 2018)
<i>Attainment</i>	Second-chance programs	Dominican Republic, Madagascar, Uganda,	No rigorous evaluation data presented, but they hold promise based on implementations in the countries listed

²³ It is not possible to express these results in terms of the standard deviation of students’ test scores because the unit of observation is the school, and not the student, so all results are in terms of school means, and there is no information on the variance of student test scores within schools.

		and Zimbabwe	(World Bank 2018)
	Implementation of universal primary education policy	Nigeria, Nigerian Civil War	Lower attainment effects were reduced by two-thirds in states where universal primary education was instituted after war (Akresh et al. 2023)
<i>Learning</i>	15-20 minute weekly phone calls and SMS messages	Botswana, Covid-19 pandemic	Increased grade 3-5 students' test scores in math (0.12 SD) (Rodriguez-Segura 2022)
		India, Kenya, Nepal, Philippines, and Uganda, Covid-19 pandemic	Improved learning (0.327 SD) on average (Angrist et al. 2023)
	"Can't Wait to Learn" program, provided tablets with educational games to out-of-school students	Sudan	Increased math scores (World Bank 2018)
	Tablets with educational games for out-of-school students + twice weekly phone calls with tutor	Bangladesh, Covid-19 pandemic	Increased numeracy scores (0.25 SD) and literacy scores (0.17 SD) (Glewwe et al. 2024)
	Building community-based schools	Afghanistan, northwestern province affected by tribal conflict more than war	Decreased distance to schools, increased enrollment rates, and increased learning outcomes especially for girls (World Bank 2018)
	Funding for infrastructure improvements	Italy, 2012 earthquake	Increased average test scores by 4.6% in math and 1.2% in Italian (Belmonte et al. 2020)
	"Learning to Read in a Healing Classroom," reading and math curriculum with social-emotional learning principles	Democratic Republic of the Congo	Marginally significant impacts (10% significance level) on test scores in reading and geometry, but no impacts on test scores in addition and subtraction (Aber et al. 2017)

Source: Authors

Based on the ten individual interventions mentioned in the literature, it is difficult to make strong recommendations about how to effectively provide education in emergencies. Nevertheless, there are a few instructive themes that emerge. Given that enrollment,

attainment, and student learning are the outcomes most often affected by emergencies, these are the primary areas to target interventions. Several articles also point out that older children who are past mandatory schooling age and who are eligible to either transition to the labor market or get married are least likely to return to school after closures (Dessy et al. 2021; Makino et al. 2021; Meyers and Thomasson 2017; Moscoviz and Evans 2022). Therefore, it may be advantageous to target enrollment and attainment interventions toward this population. On the other hand, interventions may be less effective on these children compared to younger children, so it could also be argued that scarce resources should be spent on younger children. Two studies found that building schools and investing in infrastructure during and after emergencies increased enrollment rates and learning outcomes (Belmonte et al. 2020; World Bank 2018), so this is one promising area for further research. It also seems that we can conclude that EdTech can be useful in ameliorating the negative effects of emergencies on learning. When schools are closed due to pandemics or wars, EdTech can facilitate learning which previously could not take place. Overall, with only ten individual interventions mentioned in the literature on education in emergencies, one primary takeaway here is that more research is needed. These results and recommendations are summarized below in Table 21.

Table 21. Summary of education in emergencies recommendations

I. Effective Education-in-Emergencies Practices
1. Emergencies negatively affect enrollment, attainment, and student learning. Therefore, effective interventions should target these areas, perhaps even in combination with one another.
2. Building schools and improving infrastructure after disasters, wars, and conflicts can increase enrollment rates and learning outcomes.

-
3. EdTech can reduce negative impacts of emergencies on enrollment and learning.
-

II. Ineffective Education-in-Emergencies Practices

1. There were no ineffective interventions reviewed. In many cases, education-in-emergencies interventions are providing some access to education where there was previously none, which is an improvement.
-

III. Inconclusive Findings

1. Overall, many of the findings on effective interventions for education in emergencies are inconclusive. More research is needed to determine which interventions are most effective across most contexts.
 2. More research is needed on the effectiveness of second-chance programs.
 3. It is unclear whether NGOs should target enrollment and attainment interventions toward older children (who are most at risk of dropping out and entering the labor market or marrying early) or younger children (who may yield higher returns from the investment).
-

IV. Other Recommendations

1. Reviewing more recent studies of interventions implemented during the Covid-19 pandemic may shed light on which emergency interventions are most effective across a wide range of contexts.
-

Source: Authors

H. Provision of Educational Supplies to Students

Perhaps the most obvious educational intervention is to provide students with basic learning materials such as pencils, paper, textbooks and simple mathematical tools (compass, calculator, etc.). In some developing countries, the schools are supposed to provide most or all these items, but in other developing countries students' families are expected to purchase them. Even in countries where schools are expected to provide these items, in some schools they are not provided. In addition to these "student level" educational supplies, there are also "classroom level" educational supplies, such as

blackboards and posters or charts to put up on the walls of the classroom, and even “school level” supplies, such as a school library.

Of the 32 Christian NGOs that participated in our survey, about 84% (27) responded that they have provided educational supplies to students, teachers, and/or schools. About 29% (8/28) of these organizations mentioned educational supplies in response to the question in our survey on the kinds of education programs they would like to see reviews of, or would like to have evaluated (see Figure 1).

Most of the 29 literature reviews that served as the starting point for this paper reviewed one or more studies of the impact on student learning of providing students with educational supplies. More specifically, 21 of these reviews included studies of the impact of these supplies. The most common item considered was textbooks, but there were also a few studies of other types of educational supplies. On the other hand, there are many types of educational supplies for which there are no studies at all; for example, there are no studies of the impact of providing pens, pencils and/or paper, or mathematics tools, to individual students. Another complication is that some studies estimate the impact of “packages” of many educational supplies, and sometimes combined with other educational interventions, which makes it virtually impossible to assess separate impacts for each component of the package.

Before examining specific inputs, it is important to note that most of the reviews conclude that, in general, providing material inputs to students without other changes in the classroom has little effect on student learning (Akyeampong et al. 2023; Bashir et al. 2018; Snilstveit et al. 2016). Not only are additional inputs by themselves generally ineffective, more specifically they are not cost effective in the sense that even if they

have an effect there are other policies or programs that can lead to the same increases in student learning at a lower cost (Angrist et al. 2025).

Turning to specific types of inputs, perhaps the most obvious input that students need to learn in school is textbooks. However, it is not always the case that textbooks increase student learning. For example, they are effective only if the students can read them, and in many cases they are too hard for students to read (Akyeampong et al. 2023; Bashir et al. 2018; Conn 2017; Damon et al. 2016; 2019; Ganimian and Murnane 2016; Glewwe and Muralidharan 2016; Kremer et al. 2013; Masino and Niño-Zarazúa 2016; Muralidharan 2017; World Bank 2018). This is especially the case if the textbooks are written in a language other than the students' mother tongue. On a more optimistic note, textbooks have been successful in at least one study (Glewwe, Siameh, Sun and Wisniewski. 2022); this is the study by Fuje and Tandon (2018), who examined the impact of textbooks on student learning in Mongolia.

Another surprising finding is that providing school libraries has not been shown to increase student learning (Akyeampong et al. 2023; Damon et al. 2016; Glewwe and Muralidharan 2016). Yet this finding is based on a single study: Borkum, He and Linden (2002).

Another school input which has not been shown to be effective is flip charts (wall charts), which can be displayed on easels or put on classroom walls. Many of the reviews cite this finding (Akyeampong et al. 2023; Bashir et al. 2018; Conn 2017; Damon et al. 2016; 2019; Ganimian and Murnane 2016; Glewwe and Muralidharan 2016; Kremer et al. 2013; Masino and Niño-Zarazúa 2016), but in fact all of these reviews are citing the sole study of this input, which is Glewwe et al. (2004).

Finally, in at least one study, providing school uniforms led to reduced dropping out of school, and for girls it reduced pregnancy and delayed marriage (Evans and Mendez Acosta 2021).

Clearly, more studies are needed on other types of educational inputs. For many specific policies or programs of this type, there are only one or two studies in specific countries, and so it is difficult to generalize. One common finding, which may generalize to many types of inputs, is that simply providing inputs without an accompanying support to use them effectively usually does not increase student learning. Table 22 summarizes the findings for the studies that have been completed in recent years.

Table 22. The impact of providing educational supplies to students

Level of the intervention	Input	Effectiveness
Student level	Textbooks	Effective only if students can read them (Glewwe et al. 2009; Sabarwal et al. 2014; Fuje and Tandon 2018)
	Pencils	No studies
	Uniforms	Decreased pregnancy, delayed marriage, and reduced dropping out of girls (Duflo et al. 2015)
Class level	Flip Charts	Not effective, by itself (Glewwe et al. 2004)
School level	Libraries	Not effective, by itself (Borkum et al. 2002)

Source: Authors

Notes: Yellow text (“caution”) indicates education supplies that are sometimes effective (textbooks, based on three studies) or for which evidence is positive but is based on a single study (school uniforms). Red text indicates education supplies that have been found not to be effective, but both of these results are based on only one study.

I. Curriculum Development

Curriculum Development refers to the process of designing and implementing a new curriculum and/or instructional approach. This includes developing learning materials for students along with teachers’ guides and standards. In this subsection, we present the findings from the literature on: (i) the gaps in many of the curricula in developing countries, (ii) examples of effective curriculum design, as well as (iii) what has been found to hinder the *process* of implementing a new curriculum.

Of the 29 initial review papers, 18 (62%) discussed curriculum development. To ensure that no discussions of this topic in the 29 papers were overlooked, we cast a wide net by using the following keywords for the search: “curric,” “structured pedagogy,” “scripted.” Forty-seven percent (15/32) of the Christian NGOs in our survey reported engaging in Curriculum Development, and 29% (8/28) expressed interest in seeing a review on this topic, making it the fifth most requested intervention, tied with the two previous sections.

Before we present “what works”, it is important to provide a clearer picture of the current shortcomings in the official curriculum in many developing countries. Effective interventions must address these gaps. There is ample evidence that children learn much less than the goals set out in the official curriculum. This topic is of particular importance in the context of international Christian NGOs because the curricula that are implemented in many developing countries are not at the right level for the majority of students, particularly because of the increasing heterogeneity in school preparedness (Glewwe and Muralidharan 2016; Krishnaratne et al. 2014; Muralidharan 2017). With

increasing universal access to schooling, there are tens of millions of first-generation students entering formal schooling who have limited support at home. The curricula that were previously designed for students from wealthier households are not well matched for many, if not most, students. This curricular mismatch is a key bottleneck in transforming inputs into outcomes. Since cognitive skills acquisition is cumulative, lack of understanding of foundational skills leads to a lack of understanding of further concepts. Therefore, as students pass through the school system, the variation in student preparedness increases, and the lowest performing students increasingly lag behind their better prepared classmates.

The findings from the literature reviews are consistent in that they highlight that “Teaching at the Right Level”(TaRL) (Akyeampong et al. 2023; Angrist et al. 2025; Damon et al. 2019; Evans and Yuan 2022; Ganimian and Murnane 2016; Muralidharan 2017) and structured pedagogy are highly effective and cost-effective in improving student outcomes (Akyeampong et al. 2023; Angrist et al. 2025; Evans et al. 2023; Evans and Mendez Acosta 2021; Evans and Yuan 2022; Ganimian and Murnane 2016; Glewwe et al. 2022; Kremer et al. 2013; Snilstveit et al. 2016; Stern, Jordan, et al. 2023; Stern, Jukes, et al. 2023). "These categories of interventions have also been tested under multiple delivery models and are being scaled by multiple governments, demonstrating their relevance beyond the context of a controlled study" (Angrist et al. 2025).

“Teaching at the Right Level” (TaRL) refers to methods that educate children based on their actual learning levels and skills, rather than just following the standard grade-level curriculum. This way, children learn at a pace and level that suits their individual needs,

instead of being taught at a level they are expected to be at according to their grade. TaRL can be accomplished by different approaches, such as remedial instruction and grouping children inside the classroom according to their level. It can also be accomplished by leveraging Educational Technology software that is tailored to the child's level, which was already covered in the EdTech section. According to (Angrist et al. 2025), TaRL interventions can yield gains of up to 3 additional Learning-Adjusted Years of School (LAYS)²⁴ per USD 100 per child, which is highly cost-effective.

Several studies have evaluated the impact of programs that focus on children that are lagging behind, providing them with “remedial instruction” outside of the classroom. (Akyeampong et al. 2023; Angrist et al. 2025; Ganimian and Murnane 2016; Muralidharan 2017). One of the most well-known of them is the Pratham program in India. In this intervention, low-performing students were taken out of the classroom for two hours per day to receive remedial instruction. Average mathematics and English test scores increased by 0.14 S.D. after one year, and 0.28 S.D. after two years (Banerjee et al. 2015) as cited by (Damon et al. 2019; Glewwe and Muralidharan 2016).

However, there is evidence that “although tailor-made curricula will optimize learning, tracking [of students according to their test scores] will, if implemented early on, disadvantage the weaker groups of students and increase the inequality of student achievement” (Bashir et al. 2018).

²⁴ Learning-Adjusted Years of School (LAYS) is a unified education measure that tells us that a given intervention in a country produces a certain number of years' worth of globally benchmarked high-quality learning. That is, TaRL can in effect lead to learning in one year that is equivalent to 3 years of education. For more details, see the description of Learning-Adjusted Years of Schooling Framework in Angrist et al. (2025).

Structured pedagogy interventions are scripted, detailed lesson plans provided to teachers, typically combined with teacher training on how to use them. They are designed to improve the quality of the content that—and quality of the pedagogy by which—students are taught. This type of intervention seeks to give greater support to teachers, as “many teachers in low- and middle-income countries have had a relatively low level of initial training and knowledge, influencing the standards of instruction and children’s learning outcomes” (Popova et al. 2022). Structured pedagogy can help teachers to better understand new concepts and to plan lessons in a systematic way—with each lesson building on previous lessons with clarity, minimizing the risk that students misunderstand and ensuring that foundational concepts are understood before more complex ones are covered (Akyeampong et al. 2023). Structured pedagogy can also provide innovative resources that can increase students’ engagement. Table 23 shows the logic model of structured pedagogy.

Table 23. Structured pedagogy program theory

Inputs	Activities	Outputs	Intermediate Outcomes	Final Outcomes
Evidence based content or methods, and budget to develop curriculum/plan; budget for training or hiring teachers, providing materials and any ongoing support, supervision and feedback to teachers; time and human resources to monitor and support introduction of new curriculum; time in school day set aside for intervention	(1) Teacher training (2) Ongoing teacher support, supervision, and feedback (3) Provision of teacher-oriented resources or materials (4) Provision of classroom learning materials	(1) Teachers are trained or external teachers provided (2) Planned materials and resources provided (3) Supervision, support, and feedback	(1) Teachers gain new skills and knowledge (2) Classroom practices change (the new content and methods are introduced) (3) New practices lead to student behaviors conducive to learning	(1) Improved student learning and achievement;
<i>Assumptions:</i>	<i>Assumptions:</i>	<i>Assumptions:</i>	<i>Assumptions:</i>	<i>Assumptions:</i>

(1) The government or NGO/agency has the ability to administer program, in a targeted area; (2) Educational system, schools and teachers are receptive to the intervention	(1) Trainers are available and of sufficient quality (2) Teachers will 'buy-in' to the new content and methods	(1) Teachers attend training (2) Training is of sufficient duration and quality (3) Teachers understand training (4) Relevant materials delivered in right quantities, on time, and are fit-for-purpose (5) Supervision, support, and feedback is provided	(1) Teachers understand training (2) Teachers and students react positively to new content and methods (3) Teachers apply new skills and knowledge in classroom (4) New materials are used	(1) Time-on-task is sufficient (2) Teachers attend school (3) New content and methods are more effective than previous
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Source: Snilstveit et al. (2016)

In a meta-analysis of 21 studies of structured pedagogy programs across 11 countries in South Asia, East Asia and the Pacific, Latin America and Sub-Saharan Africa, Snilstveit (2016) found that: “There is relatively strong evidence that structured pedagogy interventions can lead to substantial improvements of learning outcomes for composite, language arts and maths test scores”. The overall effect, averaged across the 21 studies, is 0.23 SD, which is a large effect for learning interventions.

In one study, structured pedagogy alone was found to be 2.7 times more cost effective than an intervention that combined structured pedagogy with coaching in the context of Buenos Aires, Albornoz et al. (2020). More specifically, the structured pedagogy alone increased grade 7 students’ scores on a science assessment by 0.55 SD, while adding coaching (which is relatively expensive) increased their scores by 0.65 SD. The 75th percentile of learning intervention effect sizes is 0.25 SD; these results are more than two times higher than that, meaning that they are extremely effective. However, the difference between these two impacts was not statistically significant, and adding the coaching intervention greatly increased the cost, so that the impact per unit of money spent was 2.7 times higher for the intervention using structured pedagogy alone. This result may be unexpected. It highlights the need to compare not only program impacts

but also their cost-effectiveness. One implication is that NGOs with limited budgets could consider focusing on structured pedagogy even when they cannot add coaching (Glewwe et al. 2022).

Akyeampong et al. (2023) have listed “Structured Pedagogy” and “Targeting teaching instruction by learning level, not grade (in or out of school)” as two of the top three “Great Buys” across a variety of education interventions. For practitioners who are looking to implement effective curriculum development, Table 24 presents the main considerations to aid in the choice between the two options. One addresses a teacher skills gap; the other addresses a student skills gap.

Table 24. Gaps addressed by Two Effective Curriculum Development Interventions

Intervention type	Gaps addressed
Structured Pedagogy (detailed lesson plans)	Teacher skills
Teaching at the Right Level	Students lacking fundamental skills and thus unable to follow the curriculum

Source: Authors

The evaluations we reviewed also described situations that hindered the effective implementation of a new curriculum. One example is from Uganda, where a major curriculum reform was initiated, but not finalized. The lack of financial resources to implement the whole program, as well as resistance from parents, teachers and academics to the new methodology, were the major causes of this unsuccessful implementation (Bashir et al. 2018). The resistance was due to a perception that the changes were “watering down” the curriculum. The authors of this case study highlighted

the importance of a new curriculum being accompanied by adequate planning, and budgeting, for support of teacher training, textbooks, revised examinations, and other required activities or materials. It may also be beneficial to involve stakeholders in the design process, to incorporate their feedback early and, therefore, increase buy-in later on (Bashir et al. 2018). The development and adoption of a new curriculum—such as one that increases emphasis on active learning and creative thinking—does not mean that there will be change. A new curriculum may demand more of the teachers, who may prefer to continue in their old ways. Therefore, teacher training and buy-in is essential for changes in curriculum to be translated into learning outcomes (World Bank 2018).

Table 25 summarizes the findings from the literature.

Table 25. Summary of Curriculum Development Findings

I. Effective or promising Curriculum Development
<ul style="list-style-type: none">1. Structured Pedagogy2. Teaching at the Right Level
II. Ineffective Curriculum Development
<ul style="list-style-type: none">1. Curricula that is too advanced for students' current learning levels, especially for students who lack the foundational skills. This characterizes most of the curriculum in developing countries. They were designed before the more widespread access to school and thus didn't take into account the heterogeneity of student levels.2. Rote syllabus (emphasis on repetition)3. Not having teacher buy-in can hinder curriculum adoption.
III. Inconclusive Findings
<ul style="list-style-type: none">1. Mixed results in improving the conceptual understanding and mathematics skills of students in South Africa: rural (0.2 SD) vs. urban (null).
IV. Other Recommendations

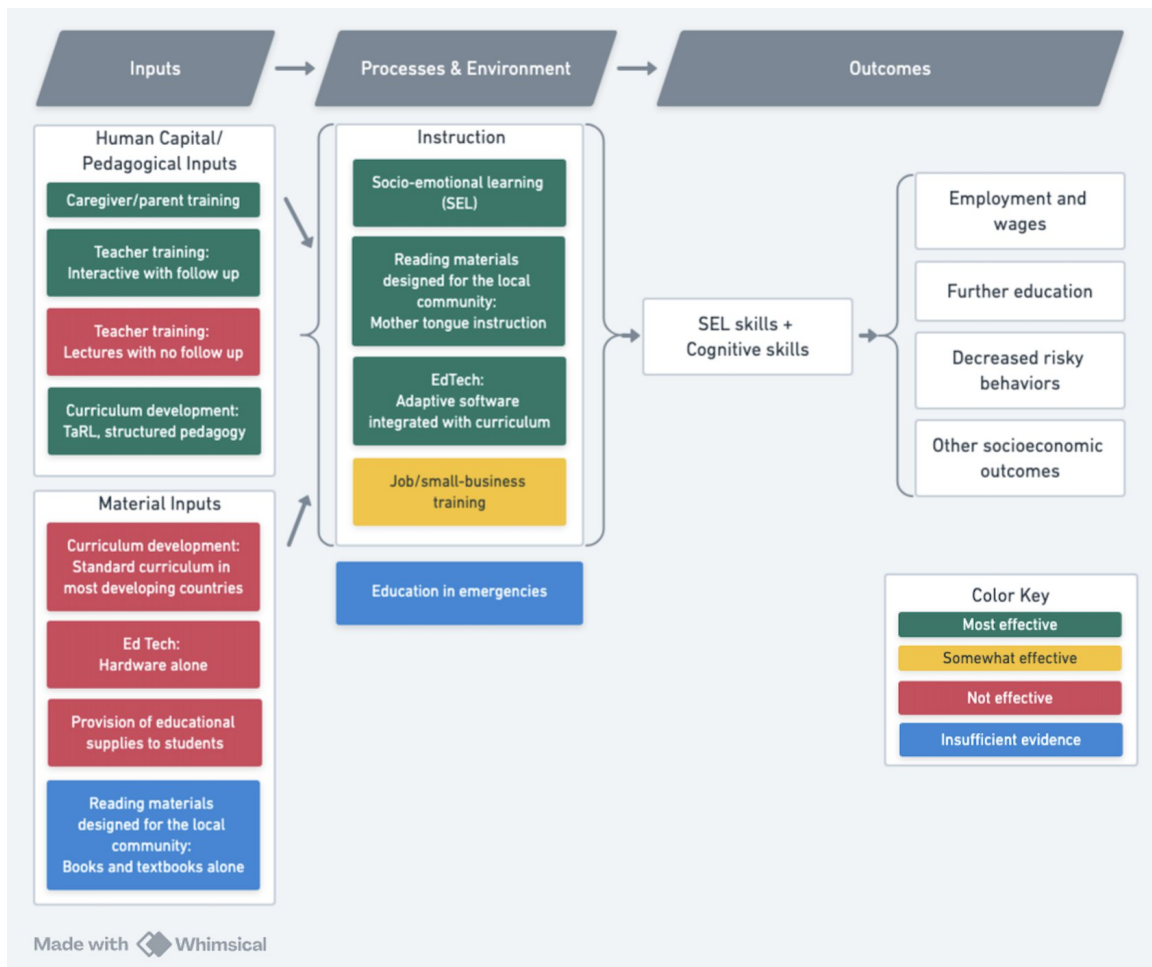
-
1. More research is needed on Christian curriculum.
 2. Implementation should especially consider buy-in from teachers.
 3. Many of the same patterns and principles found are applicable for delivery through EdTech, such as adapting to the student's level.
-

Source: Authors

V. Concluding Remarks

We have reviewed the effectiveness of nine education interventions that were of most interest to the Christian NGOs that we surveyed. We reviewed the literature on each individual intervention, providing details about the effectiveness (or lack thereof) of each intervention, including specific findings, examples, and contexts in which these interventions have been implemented. While these details are useful for a practitioner coming to our literature review for recommendations about one particular intervention, those seeking broader takeaways and generalizations about what is effective may get lost in the sea of specifics.

Figure 7. Logic model with the nine interventions and their evidence bases



Source: Authors

Notes: The logic model above covers only the nine interventions of most interest to Christian NGOs we surveyed. Some interventions are listed twice given that they fell into multiple categories of the logic model or had different levels of effectiveness based on how they are implemented. Interventions listed in green are most effective. Those in yellow are somewhat effective. Those in red are not effective. And those in blue have insufficient evidence.

To remedy that, we provide here a conceptual framework, shown in Figure 7, which outlines a logic model with our nine interventions categorized as either inputs or as processes and environments in producing desired outcomes for participants. For some interventions (i.e., teacher training, curriculum development, EdTech, socio-emotional learning, and reading materials designed for the local community), we listed them twice

given that they fell into multiple categories of the logic model and/or had different levels of effectiveness based on the way they were implemented. We have color-coded the interventions with the most effective interventions in green, somewhat effective interventions in yellow, the least effective interventions in red, and those with insufficient evidence in blue. It is important to note that this conceptual framework captures only the nine interventions that are the focus of this literature review rather than all the factors that affect student outcomes.

Within the inputs category, human capital/pedagogical inputs, such as caregiver/parent training and teacher training (specifically, interactive training with follow up), tend to be more effective than material inputs alone, like textbooks and technology. While we were unable to find much literature specifically about the effectiveness of reading materials designed for the local community, as with textbooks, these inputs by themselves are unlikely to be effective unless they are at the appropriate reading level for students and are coupled with other interventions such as literacy instruction and teacher training.

Additionally, the inputs category of the logic model also demonstrates that the most effective types of curriculum development are curricula that teach at the student's level ("Teaching at the Right Level," TaRL) and are delivered through structured pedagogy, which combines highly detailed lesson plans with teacher training (and therefore falls under Human Capital/Pedagogical Inputs). By contrast, standard curricula tend to be less effective than TaRL and structured pedagogy.

It is important to note here that while material inputs alone are not a *sufficient* condition for producing positive outcomes for students, they are often a *necessary* condition for other downstream processes which are more effective. For example, EdTech processes

that help teachers tailor their instruction to students' individual levels require specific hardware and software inputs. Therefore, the fact that these inputs alone are typically ineffective does not mean that such interventions should never be implemented but rather that they should not be implemented in isolation.

Turning to educational processes and school environment, generally speaking, interventions that target instruction are largely effective. For example, socio-emotional learning, mother tongue instruction, and using EdTech to target instruction to students' level have all been found to be effective for improving student learning. Job training programs have also been found to be somewhat effective, with greater gains for workplace training and TVET than for short-term job training given the longer exposure to the treatment in the former. On the other hand, we lacked sufficient evidence about instruction that takes place in the context of emergencies. While it is obvious that the emergencies themselves negatively affect student outcomes, it is less clear whether and what types of educational interventions are effective during emergencies. The use of EdTech in emergencies holds promise for improving student learning, especially for out-of-school students.

With regard to outcomes in the logic model, students acquire cognitive and socio-emotional skills because of their experience with education interventions (especially those in green). This learning then leads to longer-term outcomes such as employment and wages, further education, decreased risky behaviors, and other socio-economic outcomes.

Overall, our literature review finds that pedagogical inputs and instruction are more effective than material inputs alone for promoting positive outcomes for students.

Therefore, Christian NGOs working in international education can best meet the needs of their program participants by focusing their efforts on training teachers and parents to provide high-quality socio-emotional, academic, and vocational education in the language their students know best. When material inputs are required for implementing these types of interventions, they can be supplied. However, absent this broader goal, providing material inputs alone is unlikely to be the best investment.

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VII. Appendices

Appendix 1. Organizations that Participated in the Survey of Christian NGOs

ADRA (Adventist Development and Relief Agency)
Attack Poverty
Bright Hope
Compassion First
Compassion International
Congo Initiative - Université Chrétienne Bilingue du Congo
Cross Catholic Outreach
Cross International
Dignity Freedom Network
Forward Edge International
Holistic Haitian Alliance
International Care Ministries
International Needs
Lifeline Christian Mission
Mission: Hope
Nazarene Compassionate Ministries, Inc.
OneChild
SIL International
Tearfund Australia
The Anglican Relief and Development Fund
World Concern
World Vision Bangladesh
World Vision Ethiopia
World Vision Germany
World Vision Ghana
World Vision Guatemala
World Vision Myanmar
World Vision Jerusalem, West Bank and Gaza
World Vision Korea
World Vision Malawi
World Vision UK
World Vision US

Appendix 2. Details on the Spreadsheet Used to Search the Literature Reviews

We created a spreadsheet to identify which of the nine topics of interest to Christian NGOs were discussed in each of the 29 literature reviews. The spreadsheet had 29 rows (one for each literature review) and 9 columns (one for each of the nine topics of most interest to Christian NGOs). For each literature review (each row), we put into the cell associated with a particular topic (as given by the column for that cell) the page numbers in that review which discussed that topic. For example, the review by Muralidharan (2017), which is on line 10 of the spreadsheet, discussed provision of educational technology (which is in column E of the spreadsheet) on pages 336, 338 and 341-343. If the review did not discuss any studies for that topic, we left the cell blank. This was done by dividing up the 29 literature reviews among the three authors, who then proceeded to fill in all 9 columns in the rows for their assigned literature reviews (assigned lines in the spreadsheet).

Once this spreadsheet was completed, the nine topics were divided up among the three authors. If each topic had roughly the same amount of material to be reviewed, each author would have been assigned three topics, but some topics had a large amount of material while others had much less material, so the topics were divided up, based on the completed spreadsheet, to give roughly the same amount of material for each author to review.

Appendix 3. Indicators for measuring socio-emotional skills

Some validated instruments that have been used in the literature and Monitoring and Evaluation teams at Christian NGOs can consider to measure socio-emotional skills are (Cunningham et al. 2016; Puerta et al. 2016):

- Rosenberg's self-esteem scale
- Rotter's internal locus of control
- The Big Five (Goldberg 1993; John and Srivastava 1999); 10 question version by (Rammstedt and John 2007)
- Bristol's Social Adjustment Guides
- Ages and Stages – Social Emotional Scale ([ASQ-SE](#)) (Squires et al. 2002)
- Center for Epidemiological Studies Depression Scale (CES-D) (Radloff 1977)
- BESSI (Behavioral, Emotional and Social Skills Inventory) (Soto et al. 2022)

Additionally, they may consider utilizing:

- Self-reports, or teacher reports - such as “character reports”, where students or teachers assess the students' socio-emotional skills