EdTech Hub

Clear evidence, better decisions, more learning.

Session 6: How do I ensure my EdTech investments are cost-effective?

November 2022

THE WORLD BANK

UKaid
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for every child

About this document

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Notes

Background

The Strategic Choices for Education Reform workshop held in Zimbabwe in November 2022 aimed to provide a forum for senior government officials to reflect and consider the strategic reform options for their countries. The objective was to convene officials in key positions in the ministries of education, higher education, finance, and planning to learn about important issues and approaches in education; exchange experiences and lessons; develop an understanding of what is necessary to reconstruct better and more resilient education systems; and to transform the large potential of young people, through human capital investments, into development and prosperity.

EdTech Hub was invited to facilitate the day of the workshop focused on harnessing ICT for better teaching and learning. This presentation is one of several used in the workshop to promote learning, discussion, and problem solving among the participants. We have published four presentations. Details are on the next slide.

Published presentations from the workshop

We have published four presentations from the workshop, you can access these in our Evidence Library using the following links

- **Session 3: How can I develop an aligned and actionable EdTech strategy**

- **Session 4: How can I rapidly upskill my large teacher workforce?**

- **Session 5: How can I use EdTech to ensure that students are provided with quality educational content, at the right level?**

- **Session 6: How do I ensure my EdTech investments are cost effective**

Overview: Cost-effectiveness, affordability, equity

Cost-effectiveness

Most interventions that involve EdTech are ultimately aiming to deliver learning impact.

Therefore reviewing the intervention's cost-effectiveness at delivering learning impact is vital.

Affordability

Costs of most EdTech interventions can be very high, and can easily go above the entire education sector budget.

We often review pilots that are unaffordable at scale (by many factors).

Therefore, ensuing a route to affordability at scale is vital.

Equity

The cost-efficiency of interventions which are targeted at the most marginalised is normally lower.

This element of equity must be considered when deciding on which interventions to support.

You would rightly expect to pay more for outcomes of an intervention targeted at children with disabilities.

Cost, impact, cost-effectiveness

$$\frac{\text{Learning Learning-Adjusted Years of Schooling (LAYS)}}{\text{Cost ($)}} \times 100 = \text{Cost- effectiveness (LAYS per \$100)}$$

Cost, impact, cost-effectiveness

Learning

200

(LAYS)

_____ x 100   =

Cost

500,000

($)

Cost-effectiveness

0.04

(LAYS per $100)
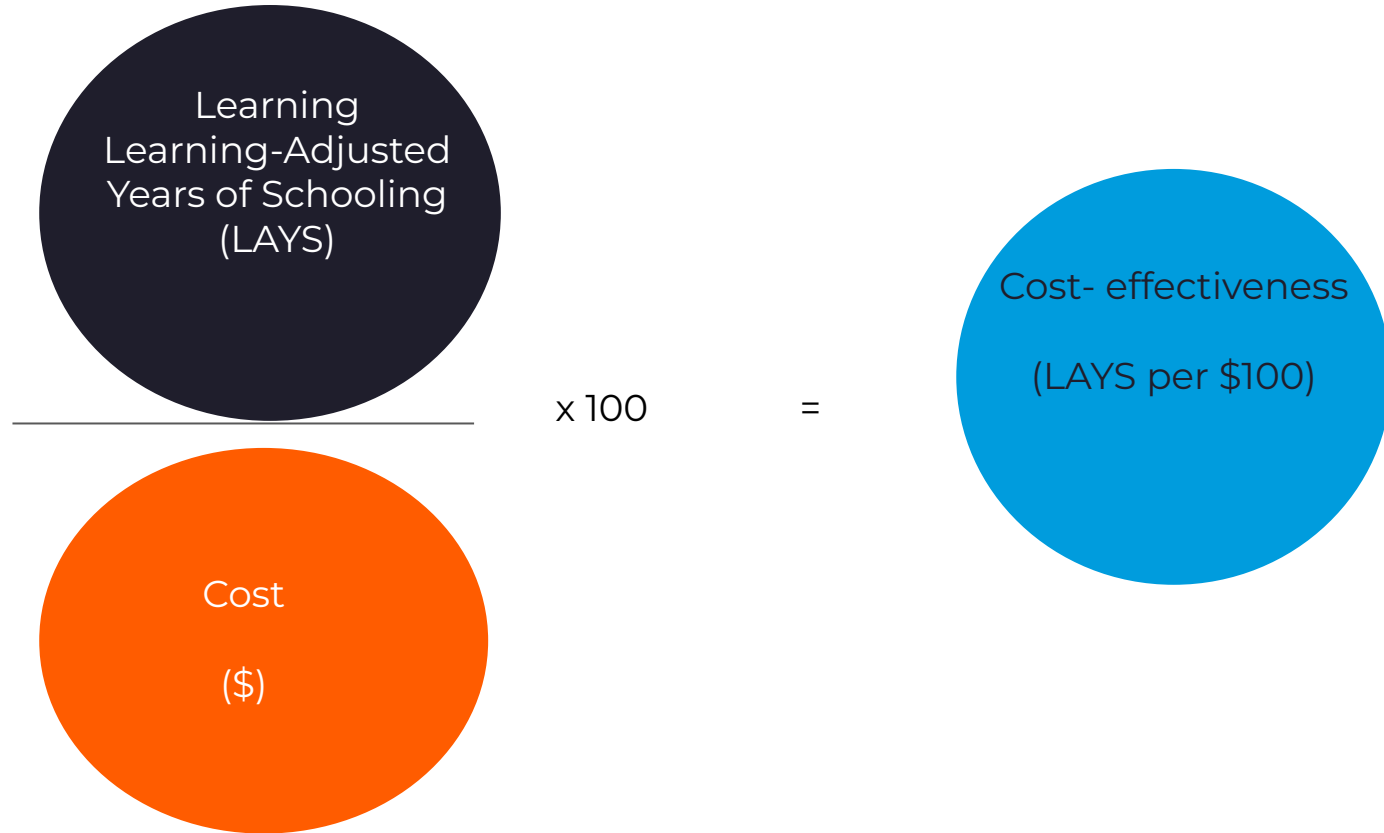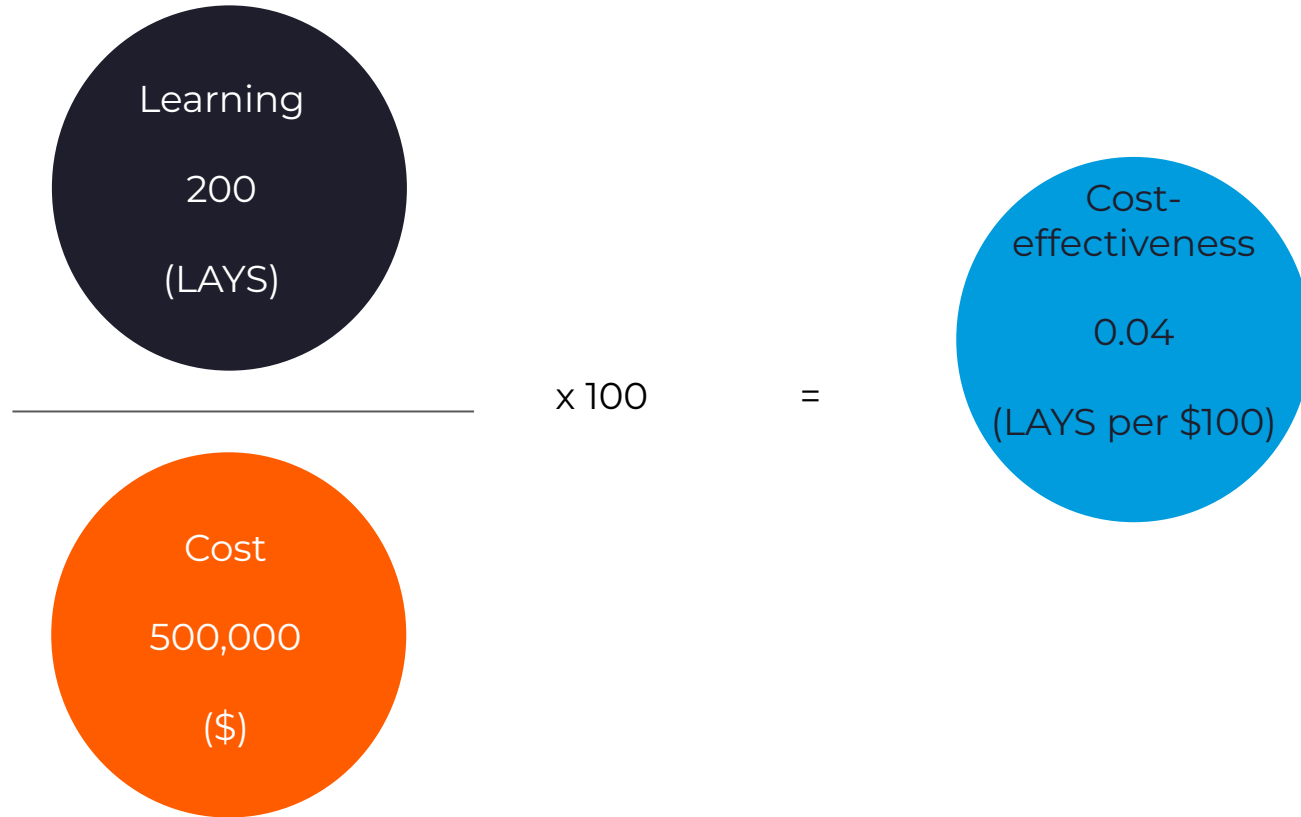
Cost, impact, cost-effectiveness

To improve cost-effectiveness, either:

Learning impact must increase

or:

Cost must decrease

Learning

(LAYS)

Cost

($)
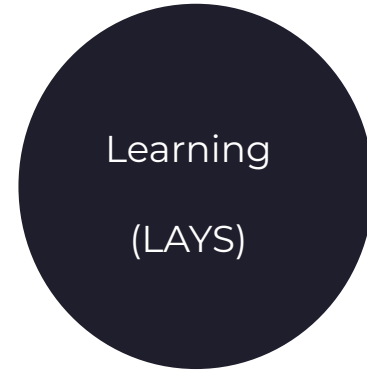
Often, with EdTech-supported interventions, reducing the costs of an intervention is more feasible than increasing learning.
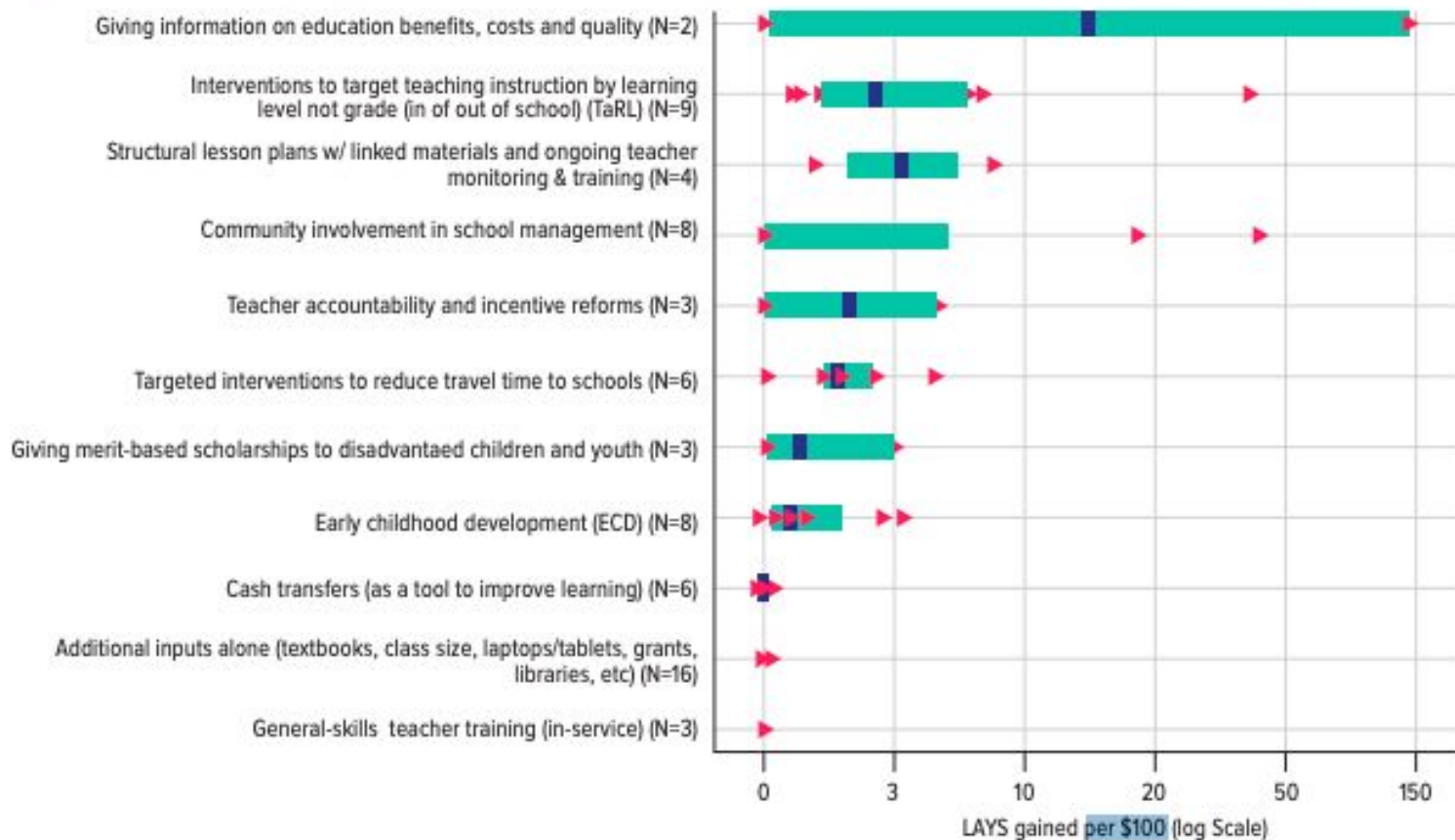
Figure 1: Learning-Adjusted Years of School (LAYS) Gained Per $100, by Category

Giving information on education benefits, costs and quality (N=2)

Interventions to target teaching instruction by learning level not grade (in of out of school) (TaRL) (N=9)

Structural lesson plans w/ linked materials and ongoing teacher monitoring & training (N=4)

Community involvement in school management (N=8)

Teacher accountability and incentive reforms (N=3)

Targeted interventions to reduce travel time to schools (N=6)

Giving merit-based scholarships to disadvantaed children and youth (N=3)

Early childhood development (ECD) (N=8)

Cash transfers (as a tool to improve learning) (N=6)

Additional inputs alone (textbooks, class size, laptops/tablets, grants, libraries, etc) (N=16)

General-skills teacher training (in-service) (N=3)

0   3   10   20   50   150

LAYS gained per $100 (log Scale)

Source: (↑Global Education Evidence Advisory Panel, 2020)

Three things to know about cost-effectiveness and EdTech

Evidence-based scaling

Learning-Adjusted Years of Schooling (LAYS) per $100 is the best metric we have for evidence-based decision-making about the cost-effectiveness of scaling an education intervention.

It does not give the whole picture, but is a very useful tool.

Costs are crucial

Unless data is captured accurately at source, both in terms of learning outcomes and costs, comparisons are problematic.

Costs are often systematically underreported, and the work that the Strategic Impact Evaluation Fund (SIEF) is doing to correct this is a great step.

Embedded approach

Committing to embedding this approach across EdTech research will allow consistent comparison that can reduce arbitrary decision-making and increase impact.

Three key considerations about cost-effectiveness and EdTech

1   **Define EdTech costs carefully**

2   **Predict and measure cost-effectiveness**

3   **Embed analysis in the short and long term**

1. Define EdTech costs carefully

Recurrent, often hidden, EdTech costs may include but not be limited to:

- Cost of repairing or replacing broken hardware

- Energy usage and connectivity costs

- Required investments in school building infrastructure to securely house expensive new equipment

- Teacher training

- Salaries of support team members

- Costs associated with parental engagement

- Costs of network equipment (routers, switches, wireless access points)

- Hosting costs over time

1. Define EdTech costs carefully

SIEF Mega Costing Model for Nudge or Information Interventions Using SMS or Recorded Messages

Cost Model						
Resource category	**Ingredient**	**Information to collect**	**Unit**	**Suggested frequency**	**Suggested data source**	**Interview questions**
Content development	Staff time spent on designing, testing and revising the content of the SMS messages/recorded messages/phone instructions/radio skits	Number of staff in this category	FTE	Once, either at baseline or endline	Interview/budget	*How many staff are involved in this category/position?*
		Roles and responsibilities	N/A	Once, either at baseline or endline	Interview	*What are their roles and responsibilities in this intervention?*
		% of time devoted to the implementation of this intervention	%	Monthly	Timesheet/interview	*How much of their time is devoted to the implementation of this intervention? (If the interviewee can not come up with the percentage, ask how many hours per week)*
		Monthly/annual salary	Local currency	Once, either at baseline or endline	Budget/salary scale	
		Will the content be reused in the future? If so, how many more children can benefit from it?	# of children	Once, either at baseline or endline	Interview	*Will the content be reused in the future? If so, how many more children can benefit from it?*
	License fee to use an existing curriculum (if applicable)	License fee	Local currency	Once, at baseline	Budget/financial report	

Source: (↑SIEF, 2020)

2. Predict and measure cost-effectiveness

- Many interventions do not measure costs and do not project the subsequent costs at greater scale.

- In other interventions, the costs are so high that the intervention is not affordable to be scaled in the country.

- We also see examples where the cost-effectiveness targeted is significantly lower than 'non-tech' options.

Recommendation:
When introducing an EdTech initiative **regularly check on the projected cost-effectiveness and affordability at scale.**

If an intervention appears to be unaffordable or is *not* cost-effective, then **continue further piloting to identify options to reduce costs or increase learning impact.**

3. Embed analysis in the short and long term

The timing of cost-effectiveness analysis should be aligned with decision points throughout the programme cycle (e.g., deciding whether or not to scale-up a programme, or deciding which of two programmes will be funded).

Committing to embedding this approach across EdTech research will allow consistent comparison that can reduce arbitrary decision-making and increase impact. The 'how' of tech is usually more important for effectiveness than the 'what' — so it needs to be an ongoing embedded process.

Overall and component costs may change over time

Learning curves are associated with the introduction of new technologies

How does cost-effectiveness analysis link to innovation in EdTech?

Affordability: Ensure an intervention is both affordable and cost-effective before scaling

It's possible to have interventions that are theoretically cost-effective at scale, but are still not affordable at scale.

In Malawi, the Unlocking Talent initiative, has worked hard to reduce costs from upwards of $40–$50 per child per year to $1–10 per child per year, in order to be affordable at scale.

In Tanzania, EdTech initiatives have leveraged teachers' personal devices to reduce costs while maintaining impact.

UNLOCKING TALENT

Equity: Promote intersections of equity and cost-effectiveness

In many cases, focusing on equity can improve learning outcomes for all.

Camfed's programme in Tanzania aims to reach marginalised girls at the secondary education level and provide financial and learning support. High cost-effectiveness was achieved as all students attending Camfed-supporting schools (not just the most marginalised) benefited from the programme (↑Sabates et al., 2018).

Technology to support children with disabilities can be particularly effective at addressing equity, alongside learning.

Conclusion: three key takeaways

Cost-effectiveness

The ratio of costs to impact can be used to compare EdTech initiatives and identify themes contributing to cost-effectiveness.

1. Define EdTech costs carefully
2. Predict and measure cost-effectiveness
3. Embed analysis in the short and long term

Affordability

Ensure an intervention is both affordable and cost-effective before starting to scale.

It's possible to have interventions that are theoretically cost-effective at scale, but are still not affordable at scale.

Equity

Promote intersections of equity and cost-effectiveness.

This element of equity must be considered when deciding on interventions to support.

References

These references are available digitally in our evidence library at https://docs.edtechhub.org/lib/CWKPJR8R

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Koomar, S., & Proctor, J. (2022). *Session 4: How can I rapidly upskill my large teacher workforce?* [EdTech Hub Presentation]. EdTech Hub. https://doi.org/10.53832/edtechhub.0138. Available from https://docs.edtechhub.org/lib/E7C9MN3V. Available under Creative Commons Attribution 4.0 International. (details)

Mazari, H., & Kaye, T. (2022). *Session 5: How can I use EdTech to ensure that students are provided with quality educational content, at the right level?* [EdTech Hub Presentation]. EdTech Hub. https://doi.org/10.53832/edtechhub.0139. Available from https://docs.edtechhub.org/lib/PPRW2NTQ. Available under Creative Commons Attribution 4.0 International. (details)

Sabates, R., Rose, P., Delprato, M., & Alcott, B. (2018). *Cost-effectiveness with equity: Raising learning for marginalised girls through Camfed's programme in Tanzania*. Policy Paper No. 18/2 (REAL Centre, University of Cambridge, 2018). https://doi.org/10.5281/zenodo.1247315. Available from https://zenodo.org/record/1247315#.YAlyUOj7Q1I. (details)

Wyss, N., Mbugua, W., & Kaye, T. (2022). *Session 3: How can I develop an aligned and actionable EdTech strategy* [EdTech Hub Presentation]. EdTech Hub. https://doi.org/10.53832/edtechhub.0137. Available from https://docs.edtechhub.org/lib/VVT2BI9M. Available under Creative Commons Attribution 4.0 International. (details)