EdTech Hub

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Cost-effective EdTech

A resource deck that summarises EdTech Hub's work to improve cost-effectiveness analysis in EdTech

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About EdTech Hub

EdTech Hub is a global research partnership. Our goal is to empower people by giving them the evidence they need to make decisions about technology in education. Our evidence library is a repository of our latest research, findings and wider literature on EdTech. As a global partnership we seek to make our evidence available and accessible to those who are looking for EdTech solutions worldwide.

EdTech Hub is supported by UKAid, Bill & Melinda Gates Foundation, World Bank, and UNICEF. The views in this document do not necessarily reflect the views of these organisations.

To find out more about us go to edtechhub.org. Our evidence library can be found at docs.edtechhub.org/lib/.

This slide deck provides an overview of the work of EdTech Hub on cost-effectiveness and the lessons learnt from it. It focuses on the opportunities and challenges of EdTech cost-effectiveness, the different methodologies available for analysis, and strategic future priorities. The purpose of this work is to establish better norms and standards in EdTech cost-effectiveness to enable improved data-driven decision-making and increased impact on foundational learning and numeracy (FLN) outcomes at scale.

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Abbreviations and acronyms used

CE   **Cost-effectiveness**

CEA   **Cost-effectiveness analysis**

LAYS   **Learning-Adjusted Years of Schooling**

SIEF   **Strategic Impact Evaluation Fund**

EdTech Hub's work on cost-effectiveness

The purpose of EdTech Hub's cost-effectiveness work

EdTech Hub's work on cost-effectiveness (CE) aims to establish **three key foundations** for data-driven decision-making in EdTech:

1. **Agreed measures** — to identify and consolidate a set of common metrics for measuring cost and learning outcomes. (**Finding** = LAYS (Learning-Adjusted Years of Schooling) / USD 100 is the measure that captures learning outcomes most comparably and holistically in EdTech. See **Slides 17, 18, and 19** for more information.)

2. **Comparable data** — gathering cost-effectiveness data with that common set of metrics, to provide an evidence base of comparable cost-effectiveness data. (**Finding** = This should result in cost-effectiveness benchmarks and minimum standards that can improve accountability of EdTech providers. See **Slides 8, 9, and 10** for more information.)

3. **Repeatable methods** — defining the elements of specific classes of EdTech interventions that have demonstrated consistent outcomes at different costs, to provide delivery standards for EdTech planning. (**Finding** = Ensuring that the critical and most cost-effective elements of EdTech implementation are highlighted is crucial for streamlining delivery and facilitating scaling. **See Slides 11, 14 and 18** for more information.)

We believe that making progress on these three foundational issues is what will help establish a 'new normal' for the sector in adopting cost-effective EdTech **(see Slides 23 and 24** for more information).

Background research on EdTech cost-effectiveness

The outputs

In order to provide **a foundation of knowledge** on cost-effectiveness in EdTech, we conducted a landscape review of the approaches of others within the sector. This culminated in three working papers on the state of cost-effectiveness analysis in EdTech:

1. Cost-Effective EdTech Paper 1: A position piece on how the sector can make progress (⇡Mitchell & D'Rozario, 2022) — this includes a literature review of key approaches in the sector.

2. Cost-Effective EdTech Paper 2: Good practice (⇡Mitchell & D'Rozario, 2022) — an analysis of good practice and guiding principles for cost-effectiveness research.

3. Cost-Effective EdTech Paper 3 (⇡Mitchell & D'Rozario, Forthcoming) — EdTech Hub's approach to cost-effectiveness analysis (CEA).

The insights from these outputs

These papers identify the pressing problems faced in EdTech cost-effectiveness:

- Widespread and significant **underreporting of actual costs** (failure to reconcile budgeted costs and include externalities like infrastructure, which are present to different extents).
- Inconsistent or ambiguous articulation of **what stated costs actually represent** (e.g., fixed and recurrent).
- Measures of **learning outcomes that are not comparable** across different contexts and intervention types, due to inconsistent use and quality of underlying data.

Background research on EdTech cost-effectiveness

Our analysis of existing cost-effectiveness frameworks identifies the different approaches currently used and enables a comparison based on their characteristics.

CEA approach	Cost (budgeted ex-ante vs paid ex-post)	Cost (disaggregated vs holistic)	Learning outcomes (contextual vs standardised)
World Bank LAYS approach	Paid (in Strategic Impact Evaluation Fund stream, Both)	Disaggregated	Standardised
Building Evidence in Education CE approach	Budgeted	Holistic	Contextualised
USAID CE Guidance	Paid	Disaggregated	Contextualised
Girls' Education Challenge VfM Guidance	Budgeted	Holistic	Standardised
Oxford Policy Management VfM Guidance	Budgeted	Holistic	Contextualised

Nine practical principles from the background research

Comparability — cost-effectiveness is about measuring and analysing data that is comparable

1. *Define data carefully*

2. *Ensure intersections of equity and cost-effectiveness*

3. *Contextualise points of comparison*

Replicability — EdTech costs and outcomes must be expressed in replicable terms to be useful for decision makers

4. *Account for uncertainties robustly*

5. *Conduct short and long term analysis*

6. *Represent data in relative terms*

Sustainability — cost-effectiveness analysis must consider the broader impacts of EdTech, and ensure they can be sustained, financially, socially, and environmentally.

7. *Consider the full lifecycle*

8. *Incentivise transparent reporting*

9. *Ensure intervention cost is proportional*

Insights from monitoring our research portfolio

What we did — **'learning by doing'**
We developed a framework for EdTech Hub's research portfolio to collect cost data and monitor learning outcomes. This meant accurate costs could be captured at regular intervals and then mapped to the relevant learning outcomes. The resulting cost templates and guidance note (⇡Mitchell, Forthcoming) can help others build on the work.

The insights from monitoring our research portfolio
- It is **complex to provide a consistent approach** to cost-effectiveness in a diverse EdTech research portfolio — comparison by type of intervention is simpler but limited.
- Engaging with **cost-capture requirements is difficult and time-consuming** for some researchers and implementers to engage with and requires significant ongoing practical support
- All cost reporting **requirements should be clearly articulated in a contract** (for both researchers and associated EdTech implementers) to ensure alignment on expectations

The evidence base of EdTech cost-effectiveness built through this process provides a data-set that can be used to help inform future comparisons between different EdTech interventions.

Guidance on how to undertake EdTech cost-capture

EdTech Hub has had feedback from multiple organisations that there is need for concise operational guidance around cost-capture, because other guidance is too long or not operationally focused. Based on our experience in providing such guidance to studies in our own portfolio, we have distilled our learning into actionable recommendations and principles.

These are the **three main steps in the operational workflow** required for anyone wanting to undertake cost-effectiveness analysis through research of EdTech interventions.

1. Communicate with the research teams in order to establish the status of costing data, and determine a timeline and responsibilities for fully completing the capture of cost data for the study.
2. Once all relevant data has been collected, determine the total cost of implementation for each study from the finalised cost data.
3. Compare this to the total number of learners in the intervention to calculate the cost per child of each study.

Further detail is shared in the forthcoming 5-page cost-capture guidance note (⇞Mitchell, Forthcoming)

Comparative analysis

What we did

We conducted comparative analysis on the cost-effectiveness data from across the studies in the EdTech Hub research portfolio. This includes an overview of the cost-effectiveness of all the studies (upon their completion) as well as a focus on specific thematic areas.

Outputs

- **Messaging for participation:** Low-cost educational messaging in West Africa: evidence on cost-effectiveness (↑Mitchell et al., Forthcoming)
- **Digital personalised learning**: Cost-effectiveness of digital personalised learning: Three interventions from Kenya (↑Anonymised for Peer Review, 2025)

What it shows

These two academic articles show how low-cost light touch interventions, like messaging, as well as high-intensity interventions, like digital personalised learning (DPL), present unique challenges to considering the cost-effectiveness of EdTech at scale. The impact of the enabling environment on the effectiveness of messaging can lead to a misattribution of learning outcomes that are not seen sustainably at scale. The sequencing of scaling DPL can lead to misrepresenting how costs increase relative to scale and improvement of learning outcomes.

Engaging with stakeholders

What we did

We engaged with key stakeholders in the sector to advocate for good practices in cost-effectiveness analysis, both in promoting the existing cases of good practice, and in debating gaps in the sector.

Outputs

- ⬆Tools for your toolbox: Collecting data for cost-effectiveness with the Brookings Childhood Cost Calculator (D'Rozario & Mitchell, 2024)

- The Strategic Impact Evaluation Fund's (SIEF) cost capture approach (see ⬆D'Rozario & Mitchell, 2024)

- Cost-Effectiveness Analysis Landing page[1]

- SIEF webinar on cost-effectiveness of messaging and other remote learning interventions[2]

What it shows

This workstream demonstrates how our collaborative approach to engaging with the research has both sharpened the technical detail of our contributions and also helped promote good practices across the sector. We have championed the positive contributions of others, as well as demonstrated our own contributions to key debates and consensus-building discussions, which are leading to an increased adoption of aligned approaches by many within the sector.

Notes

1. See https://edtechhub.org/our-topic-areas/evaluating-cost-effectiveness-in-edtech/. Retrieved June 2025.
2. See https://www.worldbank.org/en/events/2023/02/20/remote-learning-encouragement-interventions-during-the-covid-19-pandemic-evidence-on-their-effectiveness-in-alleviating-?deliveryName=FCP_1_DM171206. Retrieved June 2025

Additional detail on representing costs and cost-effectiveness

Fixed and recurrent costs

EdTech Hub's cost capture exercises include both fixed and recurrent costs, in order to allow greater flexibility in comparing the analysis after completion. Some interventions may have fewer fixed costs, or these may not be paid up front, but this may cause recurrent costs to be higher. Therefore, comparisons with interventions with a different cost profile must take these differences into account over the life cycle of a programme.

Absolute cost vs marginal cost

For some audiences, the cost above 'business-as-usual', or marginal cost, is more significant than the absolute cost. However, in order to derive this accurately, and in a way that can be compared across different contexts, an absolute cost must first be understood, with a thorough accounting for the standard of provision / quality indicated by each cost category. If the cost of an intervention assumes connectivity, the capacity of that connectivity is relevant to the cost profile, and can impact the effectiveness of its outcomes.

Outcomes measurement and LAYS: Approaches to education quality and productivity

Varying approaches to outcome measurements

Approaches to measuring educational outcomes for cost-effectiveness often fall in a spectrum between emphasising quality of learning for educationalists, or productivity of schooling for economists.

Learning outcomes for educationalists
Focusing on cognitive development, tends to lead to measuring learning outcomes through standardised assessments. This de-emphasises broader impacts of education, which may be harder to measure. However, comparing the learning outcomes of students with different educational experience requires more data and context to ensure such comparisons measure capabilities fairly and appropriately.

Productivity outcomes for economists
When the comparison of outcomes goes beyond the educational domain, other measures are necessary, which often rely on economic terms to determine the productivity of education, such as Return on Investment. While these approaches may capture some broader benefits of schooling beyond cognitive development, they reduce the complexity of that impact to a monetary value.

Two additional considerations for current context

Cuts to educational programming
The changing nature of the sector, and the associated cuts to education spending, may mean that economic representations (such as Return on Investment or cost-benefit analysis) are more widely required for comparison. However, the risk is that the importance of the broader benefits of education can be minimised in such cross-sector equations. A continued commitment to LAYS emphasises quality of education, as well as quantity and progression within the educational system.

Articulating LAYS expansively
Within EdTech Hub, our primary focus has been on comparing the outcomes of different types of educational interventions using technology. However, other audiences, donors, and implementers may require analysis resulting in economic outcomes. Our work on further adapting LAYS to ensure the metric reflects the full contribution of education to cognitive, social, and economic development, facilitates potential analysis of EdTech outcomes in economic terms, but requires further research to be quantified. This approach aligns international standards with national curricular aims, which is important in order to improve buy-in from government, teachers, and community stakeholders.

Using LAYS in the EdTech Hub research portfolio

EdTech Hub considers its focus on LAYS to draw on positive approaches from both sides of this spectrum. It reflects our interest is in comparing the productivity of different types of educational interventions for an education-focused audience.

Study	Country	LAYS	Cost (USD)	LAYS / USD 100	Sample
Digital Personalised Learning for pre-primary education **(EIDU)**	Kenya	.422	6.88	4.61	2,885
Low-tech personalised learning to improve girls' education **(mShule)**	Kenya	.181	10.79	1.68	648
Estimating the Impact of Educational Television on literacy, gender, and social and emotional learning (SEL) **(Busara)**	Kenya	.11	1.67	6.77	3,654

This kind of illustrative data from three studies from Kenya in the EdTech Hub research portfolio provides a valuable data point to inform decision-making, but should be supplemented with additional insights regarding the context, extent and scale of the implementation. See https://edtechhub.org/where-we-work/kenya/. Retrieved June 2025.

Recommendations and priorities for embedding cost-effectiveness in EdTech decision-making

Accelerate adoption of current good practices

Momentum within the sector indicates an encouraging trajectory towards alignment on good practice, but one that needs ongoing work for rigorous and transparent reporting practices. Two main emphases that contribute to this progress are **rigorous capture of real costs**, rather than budgets and forecasts, and **adjusted LAYS** which reflect variations in learning in each context.

Rigorous cost capture
Cost capture tools from the Strategic Impact Evaluation Fund (SIEF) and Brookings demonstrate key methods for defining and measuring costs in comparable ways. These focus on making tools available to a wide range of implementers and researchers to capture costs thoroughly and expansively. These provide an important emphasis on total cost of ownership, and verifying actual costs, rather than relying on budgeted or forecast costs.
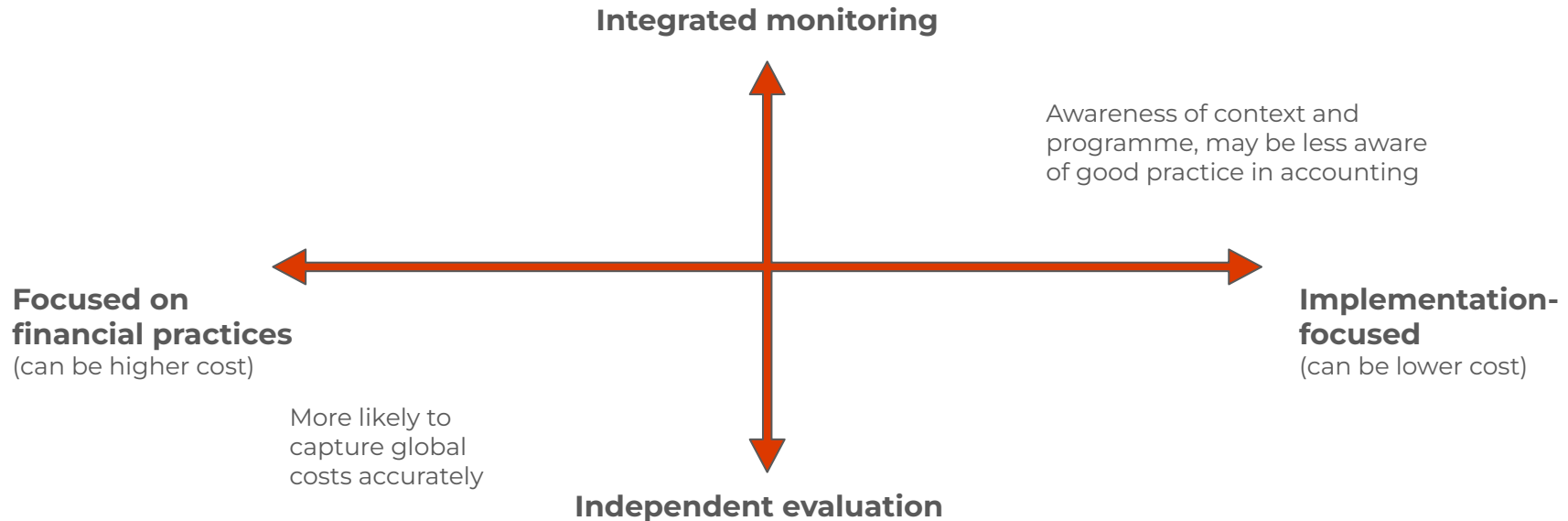
Adjusted LAYS
Using 'micro-LAYS' approaches to express the impact of learning outcomes in a manner relative to the value of years of schooling within a particular national context is important. However, the sector should focus on further adjustments to LAYS based on additional factors, such as regional variation, relative value of a year of schooling at primary level, vs secondary, or consideration of other subject matter beyond basic literacy and numeracy. These insights can provide more nuanced insight into the mechanisms that drive the effectiveness of EdTech.

Cost capture approaches and trade-offs

Cost capture and the end user

The current emphasis in cost-capture tools, as shown in the Brookings and SIEF tools, is simplification that allows users with less financial management training, and who are closer to the data (i.e., the point of expenditure) to capture costs (see ⬆D'Rozario & Mitchell, 2024). This can also have the benefit of reducing the cost of reporting accurately, as it becomes primarily a monitoring process integrated into the project management workflow, rather than an additional evaluative process conducted at the end. Some of the tradeoffs can be seen in the following matrix analysis:

Integrated monitoring

Awareness of context and programme, may be less aware of good practice in accounting

Focused on financial practices
(can be higher cost)

Implementation-focused
(can be lower cost)

More likely to capture global costs accurately

Independent evaluation

EdTech Hub's main recommendations for good practice

In addition to the two good practices of rigorous cost-capture and adjusting LAYS, highlighted in Slide 21, which are already seeing adoption within the sector, primarily for assessing completed projects, there are other practical changes in EdTech practice that could be made to expand the use of CEA for planning, procurement, and accountability mechanisms within the sector:

- Capture all data relevant to costs in order to articulate cost-effectiveness in categories (e.g., 'marginal cost above business-as-usual', or 'post-pilot cost at regional scale') that can be compared to other specific contexts or potential interventions.

- Adjust LAYS calculations to incorporate greater nuance based on learner trajectories and national curricular aims, allowing them to be relevant to local, national, and international stakeholders.

- Cost-effectiveness analysis for both evaluating past interventions and assessing the viability or sustainability of future interventions requires attention to localised factors and full engagement of local stakeholders.

- Require EdTech suppliers to meet minimum standards for both provision and outcomes for a given cost, so that an agreed benchmark of cost-effectiveness is the starting point for accountability and implementation fidelity.

Future directions

EdTech Hub's work on cost-effectiveness concludes with the cross-cutting analysis of the research portfolio and the related outputs. Our assessment is that the sector can continue to make progress in establishing **a new-normal in cost-effectiveness in EdTech** by engaging in three main priorities:

1. Develop a ***benchmark of minimum standards*** for evidence-based EdTech decision-making to give stakeholders a reference point for what they can reasonably anticipate in terms of learning outcomes, at what cost per child, with different forms of EdTech.

2. Develop ***practical tools for decision-makers*** to ensure better planning for targeted procurement and a mechanism for future accountability. This would involve templates that map expected costs to desired outcomes with specific benchmarks, features, and cost categories aligned.

3. Embed consistent ***cost-effectiveness research*** within EdTech longitudinal research studies to continue to build a critical mass of practical and comparable insights, and within this, adapt foundational learning assessments which form the basis for measuring learning outcomes.

Each of these recommendations is **focused on strategic priorities for evidence-based decision making** within EdTech: ensuring high-quality solutions, building the evidence base for scaling these solutions, and ultimately ensuring better spending for strategic impact on learning outcomes.

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Feedback

EdTech Hub's work on cost-effectiveness in EdTech is led by Joel Mitchell and has taken place across a 4-year period from 2022 to 2026.

Please get in touch with Joel Mitchell (joel@edtechhub.org) if you have any questions or comments or would like to discuss any element of the slide deck in more detail.