LEARNING BRIEF

#07

What Should Ministries of Education Prioritise When Crafting Their EdTech Strategies?

EdTech Hub

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Recommended citation

Thinley, S. (2024). *What Should Ministries of Education Prioritise When Crafting Their Edtech Strategies?* [Learning Brief]. EdTech Hub. https://doi.org/10.53832/edtechhub.1054. Available at https://docs.edtechhub.org/lib/78VE3959. Available under Creative Commons Attribution 4.0 International.

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Acknowledgements

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Contents

Abbreviations and acronyms

ICT	Information and communication technology
GEEAP	Global Education Evidence Advisory Panel
GPE	Global Partnership for Education
OECD	Organisation for Economic Co-operation and Development
PDIA	Problem-driven iterative adaptation
PPP	Public-private partnership
SABER	Systems Approach to Better Education Results

Why this question matters

Across the world, national EdTech strategies have evolved from aspirational political documents with little basis in reality, to a codified approach, to designing and implementing the use of education technology (EdTech) in a country. Interest in developing EdTech strategies related to operational targets and outcomes has increased over the past few years. For this reason, there is a growing need to support governments in developing such guidance documents. EdTech strategies may go by other names, such as 'ICT in Education Master Plan' or 'Digital Learning Roadmap.' Though there may be some differences in meaning, these terms generally refer to a codified, government-led approach to designing and implementing EdTech in a country.[1]

Increased interest in EdTech strategies since the Covid-19 pandemic

The Covid-19 pandemic caused one of the largest disruptions to learning, impacting over 1.9 billion learners on a global scale.[2] During the pandemic-related school closures that took place across the globe, EdTech was leveraged as a way of ensuring learning continuity. Countries with established EdTech strategies were better equipped to respond to the pandemic and its effects due to their advanced preparation and readiness for large-scale remote learning.[3]

Since the reopening of schools after the pandemic, many countries are now prioritising digital transformation of the education sector and are considering how to integrate EdTech across their education systems. Systematic strategy documents can help codify this thinking and clarify the course of action and lines of accountability for different stakeholders from the education, government, and technology sectors.

EdTech presents an opportunity to improve learning outcomes

Equal access to high-quality learning opportunities for all remains a significant challenge around the globe and has been exacerbated by the effects of the Covid-19 pandemic.[4] The flexibility of EdTech can help reach learners marginalised by poverty, language, disability, gender, and being out of school.[5, 6] However, unequal access to technology can widen inequalities.

Effective, affordable, and sustainable use of EdTech requires planning and a supportive enabling environment. EdTech implementation is complex and spans sectors of education, information and communication and technology (ICT), public and private investment, and learning communities.[7] This complexity and breadth make it essential that evidence-based strategies and policies are developed collaboratively to provide guidance on realising the

full potential of EdTech to enhance learning outcomes.

EdTech's potential for systemic impact

EdTech has the potential to improve underlying system components in addition to teaching and learning. EdTech can be used at the systems level to inform decision-making and improve the allocation of teachers,[8] schools, and educational resources—including technology infrastructure. However, realising such system-level impact requires EdTech deployment to be specific and based on the intended goals set out in a strategy design. Strategic planning and mapping the use of EdTech is vital and needs to be carefully considered by policymakers.

Additionally, EdTech strategy development is a useful tool for coordinating and catalysing collaborative planning and implementation. A mapping exercise of digital learning platforms in over 184 countries found that many digital learning initiatives used during the Covid-19 pandemic lost momentum as schools reopened and the pandemic came to an end.[9] More specifically, the mapping uncovered that 32% of national digital learning platforms that had been identified no longer existed, had not been updated since 2020, or had links that did not work.[10] Furthermore, EdTech initiatives, such as the introduction of new digital learning platforms, take place in silos and often fail to build synergies with existing interventions and initiatives.[11] The development of EdTech strategy documents can serve as a way of taking stock of existing EdTech initiatives and strategising how to maximise their positive impact. Additionally, having an agreed guidance document that brings together multiple stakeholders and aligns them under a unifying goal can be helpful in ensuring accountability, sustainability, and impact.

Key insights to improve practice

Government priorities are subject to regular shifts due to both internal and external pressures. A collaborative process for EdTech integration, where public, private, and civil society sectors participate, can ensure that good practices are followed by stakeholders from national policy to local operational levels.

Acknowledging the limitations of EdTech

An EdTech strategy should work in service of a clearly articulated educational purpose, instead of 'going digital' merely for the sake of preserving existing content and power structures.[12] Adopting a learning-first rather than a tech-first approach is vital. Policymakers must first consider educational goals before determining the potential role of EdTech in meeting those goals. Placing educational goals at the forefront is essential to ensure that policies are, first and foremost, aimed at improving the learning environment and learning outcomes.

Additionally, EdTech interventions entail more than hardware distribution. Evidence points to the ineffectiveness of approaches that focus on hardware alone.[13] Beyond hardware, strategies and plans should consider training, connectivity, access, software, content, and other components crucial to a robust EdTech ecosystem.

Key principles for EdTech strategies

The development of effective, inclusive, and sustainable EdTech strategies is underpinned by a few key principles. When developing an EdTech strategy, particular attention must be paid to making sure it is:

1. Learner-centred
In order to ensure improved learning outcomes, it is important to have learners/students as the principal beneficiaries of the education and the proposed use of EdTech. EdTech initiatives proposed within a strategy should be tied to identified education challenges and the potential to impact learning outcomes.[14]

2. Comprehensive and achievable
An effective EdTech strategy should offer enough depth to make a strategy applicable and relevant, while also ensuring it is actionable for decision-makers, education practitioners, and leaders.[15] Without such an approach, strategies often do not get implemented. One way to make a strategy actionable is by providing tools for implementation, such as a framework for budget and management decisions. Additionally, it is essential to recognise that stakeholder ownership plays a large role in ensuring feasibility.

3. Consultative and inclusive
The guiding vision and goals of an EdTech strategy should be determined by government leaders and based on stakeholder consultation and engagement as well as an understanding of existing access, opportunity, and equity gaps in the context.[16] This is important given the multi-sectoral nature of education systems and the need for enthusiastic buy-in from all players to ensure the successful implementation of an EdTech strategy.

4. Attentive to disparities
An EdTech strategy should identify and address issues of equity such as gender, religion, socio-economic status, and special educational needs and disabilities. It should pay particular attention to where disparities intersect and seek to

address the specific needs of different groups.[17] If a strategy does not do this, it could exacerbate existing disparities rather than address them.[18]

5. Sensitive to country contexts
It is vital to understand the broader EdTech ecosystem and actively engage key stakeholders from the onset of strategy development. If a strategy is not sensitive to country contexts, it can negatively affect successful and effective implementation. An evidence-based approach using up-to-date, robust, and reliable data is recommended here. This includes, but is not limited to, education sector analyses and data on ICT infrastructure.[19] Additionally, the strategy should focus on contextually specific challenges and address opportunities for building resilience.

The process of developing an EdTech strategy

Although there is no single way to develop an EdTech strategy, there are steps and processes that can form the basis of developing a sustainable and resilient EdTech strategy. Some of these key steps are discussed in detail throughout this section. Given the context-specific complexities associated with developing a strategy, the steps below present a generalised path for the successful development of an EdTech strategy and are not intended to be followed in chronological order or as a prescriptive process.

1. Building consensus

In the early stages of developing an EdTech strategy, it is imperative to generate an understanding of how it will fit into and ultimately work as a part of a broader education policy landscape. Gaining clarity on the following questions can be a helpful way to build this understanding.

- What does the existing education and ICT policy landscape look like at various relevant levels (sub-national, national, regional, and global)?
- What EdTech or ICT in education policies, plans, or strategies already exist?
- How does or will the anticipated strategy relate to, work in service of, or contradict existing laws and policies?

Additionally, ownership and accountability are essential for sustainable implementation. Given the highly cross-cutting and multi-sectoral nature of EdTech, involving a range of stakeholders is paramount for the successful development and implementation of an EdTech strategy.

Key stakeholders should be identified and involved from the first stages of strategy development and continuously engaged throughout the process. Such involvement will ensure that the strategy reflects inputs from across the EdTech ecosystem and supports broader stakeholder buy-in. In addition, in order to progress, involving a wide group of stakeholders early and

consistently is necessary for strategy implementation and accountability, as their involvement enhances buy-in and ownership. Stakeholder engagement can take the form of consultative workshops, focus groups, or key informant interviews, and these must include local, sub-national, and national-level players. Across contexts, key stakeholders generally include government ministries (and organisations with authority to establish regulations), end-users (learners, teaching staff, ICT support staff, school leaders etc.), private sector representatives, research and evaluation communities, community and local leaders, and multilateral and bilateral development partners.[20] However, it is important to note that this list may vary depending on specific country contexts.

A key recommendation based on insights from on-the-ground implementation is to consider setting up an inception report, which outlines the purpose, process, and intended outcomes of the strategy, as part of the early stages of strategy development. An inception report can serve as a roadmap that outlines key roles and responsibilities for all the groups involved. It can also serve as a way to set and manage expectations around anticipated outcomes.

2. Setting up a steering committee and technical team

As discussed earlier, a successful national EdTech strategy requires keen coordination and effective communication across a wide range of stakeholders. It is, therefore, important to have a governing body that is responsible for the details of implementation, iteration, and reflection.

One way to do this is through the establishment of core teams within the ministries involved in the implementation of the strategy to provide strategic guidance over the design and implementation of the strategy. The core team should be organised into targeted working groups with clear and complementary mandates. The following are examples of such groups.

- **A steering committee**
  This group would take on a more strategic managerial role and be responsible for the overall strategy, establishing short-term priority tasks, reviewing the results, and assessing changes that need to be made based on reviewed results.
- **A technical team**
  The technical team will take a more hands-on role in developing operational strategies and tracking implementation day-to-day. This group will be responsible for ensuring the activities necessary for strategy implementation are carried out in a timely manner.

The steering committee and technical team should address questions such as:

- Who should be responsible for certain aspects of

implementation and coordination?

- Who should be involved in coordination discussions and planning?

The committee should also closely monitor, track, and ensure the progress of the implementation of various projects through rigorous documentation and consistent communication among the various stakeholders.

3. Situation analysis

During the early phases of developing an EdTech strategy, a situation analysis should be conducted. This should be undertaken to understand what has already been done and to better align the EdTech strategy with existing national and regional policy documents that establish guiding priorities for countries and regions. Some of the topics to cover include:

- **The current state of education**
  A deep dive into existing educational challenges as well as reforms being implemented to address them. This will help identify how EdTech can improve the effectiveness and efficiency of existing reforms. It is also important to identify target demographics that can be supported through the use of EdTech.
- **Technology infrastructure, ownership, and usage**
  A successful situation analysis should highlight information and trends on access to electricity and the internet, as well as ownership of devices such as computers, mobile phones, TV, and radio. It should also present any available data on inequities (e.g., gendered, urban vs rural) in access, usage, etc.
- **Policy environment**
  A comprehensive mapping of the policy ecosystem as it relates to EdTech is a core element of a situation analysis. Strategies need to be developed in alignment with pre-existing policies and priorities that relate to EdTech. Significantly, such policies and priorities might include those developed by parties not traditionally associated with education or technology.
- **The current state of the EdTech ecosystem, including private sector engagement**
  EdTech strategies must be informed by assessments of EdTech ecosystems, including innovation actors and initiatives in the private sector. This will position policymakers to better evaluate and improve EdTech reforms and better support and engage EdTech vendors.

4. Selecting EdTech modalities

Against the backdrop of the situation analysis and stakeholder consultations, an EdTech strategy should provide a range of EdTech solutions and initiatives to address education outcomes that are tailored to a specific context. When

considering appropriate EdTech modalities and approaches, it is noteworthy that the best technology is one that users already have access to, are familiar with, and can afford.[21]

Evidence suggests that using multiple modalities to communicate and deliver content can enhance the reach of educational programmes.[22] Multimodal approaches, referring to EdTech strategies that combine high-, low-, or no-tech modalities, can increase the likelihood that students who are marginalised or otherwise have limited access to education can continue learning from and with various forms of support.

5. Identify approaches to design and delivery

National priorities have an impact on successful implementation. It is, therefore, important for EdTech strategies to remain agile and responsive to changing national priorities. This, coupled with the rapidly changing nature of EdTech, underscores the need for EdTech strategies to move away from more traditional implementation approaches driven by work plans, set timelines, and Gantt charts.

Agile and iterative approaches to implementation present ways to de-risk investment in EdTech while also ensuring a strategy is responsive to changing conditions. When developing EdTech strategies, it is advisable for governments to explore various delivery approaches that best align with their specific needs and context.

The following are examples of agile and iterative approaches to delivery.

An agile approach to implementing .technology

This approach presents a dynamic way of working that is especially relevant for using technology in various contexts. The approach is native to the technology sector and involves discovery, alpha, beta, and trial phases. The discovery phase is intended as a space for problem identification. The alpha, beta, and trial phases are intended for product, intervention, or programme testing, adapting, and improvement, all with the aim of bringing the product or intervention to scale.[23] See **Figure 1** below for a visual example of this approach.

Problem-driven iterative adaptation (PDIA)

PDIA is a process that uses rapid feedback loops to develop contextually relevant solutions. This method was first developed for use by stakeholders in the international development space and is a useful tool to support iterative decision-making and policy development.[24] See **Figure 2** below for a visual example of this approach.

Figure 1. Developing a National EdTech Strategy

Source: *Coflan, Caitlin, Natalie Wyss, Sangay Thinley, and Mark Roland. 2022. 'Developing a National EdTech Strategy'. Working Paper. EdTech Hub. https://doi.org/10.53832/edtechhub.0142. Available at https://docs.edtechhub.org/lib/2437EGZU.*

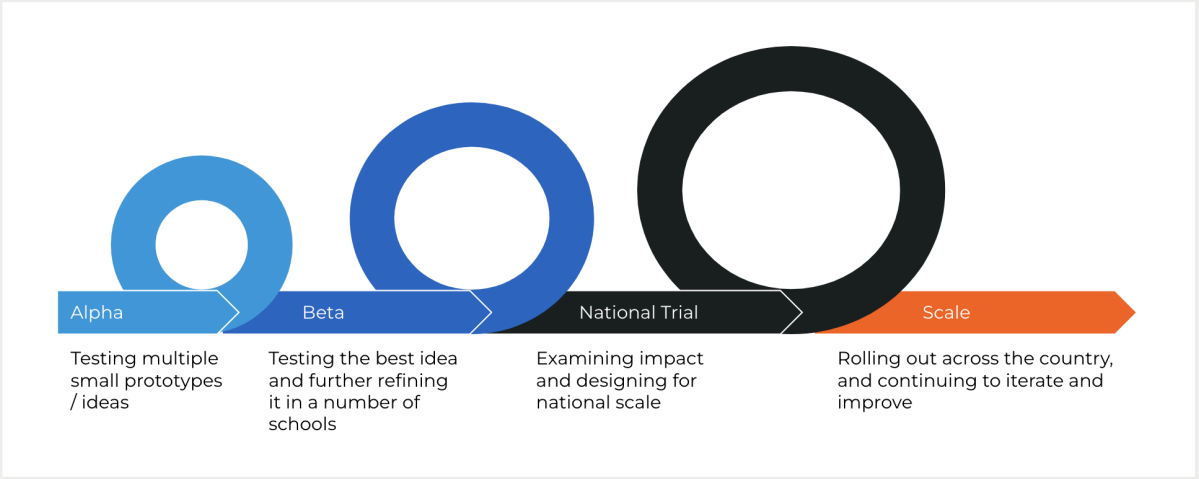
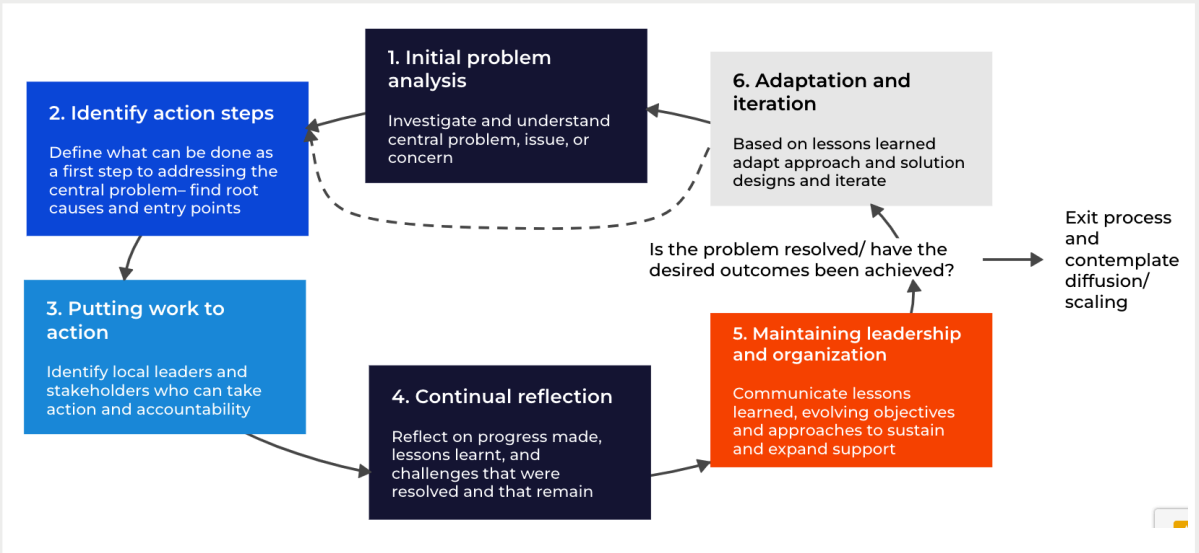


Figure 2. Developing a National EdTech Strategy

Source: *Coflan, Caitlin, Natalie Wyss, Sangay Thinley, and Mark Roland. 2022. 'Developing a National EdTech Strategy'. Working Paper. EdTech Hub. https://doi.org/10.53832/edtechhub.0142. Available at https://docs.edtechhub.org/lib/2437EGZU.*



6. Maintaining and updating a strategy

To ensure scalability, education ministers must consider a range of delivery approaches and commit to the most contextually relevant model. This level of consistency is crucial. However, it is equally important to remain nimble and responsive to implementation data. To ensure effective and responsive implementation of an EdTech strategy, the document outlining it must be maintained and updated regularly. This requires building adaptive monitoring and evaluation (M&E) systems that are keenly aligned with iteration plans. Monitoring is a process that provides information regarding ongoing changes taking place. However, this information cannot tell us whether the changes taking place have any direct or indirect impact on the desired outcome(s).[25] This is where the process of evaluation comes in. Evaluation refers to assessing whether the data collected through monitoring exercises illustrates changes in the desired impact of a specific intervention.[26] Both processes are crucial to ensure accountable implementation and progress towards strategic objectives.

A successful M&E framework distinguishes long-term and short-term objectives while also identifying key success indicators. When using EdTech, it is essential to consider how the key indicators contribute to enhanced learning outcomes. Learnings acquired from M&E can feed back into the programme cycle. These learnings can also be made available to all relevant stakeholders to inform strategic and long-term efforts. Additionally, M&E findings can be used to help formulate budget estimations and make informed decisions about resource allocation.[27]

Key components of an EdTech Strategy

Not all EdTech strategies look the same. The decision of what components to prioritise within a strategy will depend on the local context, the specific challenges that a country is experiencing, and the available opportunities. That said, there are global guidelines and good practices that can help guide the development of comprehensive EdTech strategies. Comprehensive plans will cover a holistic range of components but will also offer more detailed considerations of a select number of these components as principal priority areas.

It is crucial to recognise that EdTech does not improve learning outcomes in isolation—when designing an effective EdTech strategy, a systems approach is needed. Such an approach should place learners at the centre and consider the wide-ranging stakeholders and systems involved in EdTech implementation.[28] Insights from the 2022 Transformation Education Summit suggest that comprehensive EdTech strategies should focus on the '3Cs' of content, capacity and connectivity.[29] In addition to the 3Cs,

the World Bank's Systems Approach to Better Education Results (SABER-ICT) policy framework provides a robust overview of components to be included in an effective and comprehensive EdTech strategy.[30]

The degree to which each component is addressed in a strategy is context-specific. The classification of components listed below is informed by the 3Cs, the SABER-ICT policy, and EdTech Hub's collective knowledge generated from supporting several governments to design and implement EdTech strategies.

- **Vision and planning**
  This involves defining a clear idea of how and why EdTech will be used in practice, as well as how the vision will be achieved. This can be categorised into short-, medium-, and long-term goals and objectives to ensure ease of implementation. Key indicators for the success of the strategy should be aligned with these goals and objectives.
- **Content**
  It is paramount to ensure high-quality, curriculum-relevant digital teaching and learning content is available through digital learning platforms. This requires quality assurance, curriculum alignment, and clear standards for content. Evidence suggests that it is advisable to balance platform interactivity with offline functionality.[31]
- **Teacher professional development (TPD)**
  Strategies should address how teachers will be provided with technical and pedagogical professional development support to use EdTech in both pre- and in-service environments. It is vital to ensure continuous support for teachers to adequately integrate technology into their pedagogical practices and their capacity to use technology in the classroom more generally. Given the rate at which technology evolves, continuous professional development offered to in-service teachers is crucial to ensure teachers are equipped with relevant and up-to-date knowledge and skills for the effective use of EdTech. In addition, research suggests that meaningful adoption of EdTech requires initial training needs to be complemented by a series of follow-up activities to consolidate learning. Training cannot be delivered as a one-off exercise.[32] Finally, it is also advisable to consider how technology can be used to facilitate teacher continuous professional development.
- **Education management**
  EdTech strategies typically also address the use of EdTech to support education systems, not just teaching and learning

activities. This can include using data for decision-making, specifically through education management information systems (EMIS).

- **Skills and competencies**
  Focusing on developing the knowledge and skills of teachers, administrators, children, and caregivers to use educational technology for learning is a key component of successful EdTech strategies. This could involve identifying digital competency standards, offering support and assessment to enable digital literacy, and implementing digital-based lifelong learning opportunities across an education system.
- **EdTech ecosystem and role of the private sector**
  National EdTech strategies should be informed by an understanding of the broader EdTech ecosystem, which includes the private sector. A robust understanding of this ecosystem is fundamental for the strategic planning and implementation of EdTech. This presents the opportunity for the EdTech strategy to leverage existing research and innovation to achieve positive compounded impacts. Engagement with private sector actors can help maximise the use of scarce resources and also offers the potential for more sustainable and diverse streams of funding for plans.
- **Equity, inclusion, safety**
  EdTech strategies should prioritise approaches to EdTech that aim to close digital divides, prioritise equity, and promote ethical practices related to ICT in education, including safety, privacy, and security. Given EdTech's potential to exacerbate existing inequalities, EdTech strategies need to go beyond just addressing the digital divide and actively adopt pro-equity approaches. One way to do this is to carefully consider reaching marginalised learners through the use of multi-modal and low-tech approaches, such as television, radio, SMS messaging, and more. It is advisable to leverage devices students have access to, and in contexts where students don't have access to any technology, provision needs to be explored.
- **Safety and privacy**
  It is critical that strategies prioritise ethical approaches and practices related to EdTech. This includes data safety and security, privacy provisions, and digital ethics. This is particularly important when students and young learners are accessing digital spaces.

- **Budget and funding**
  Sufficient budgets need to be made available to cover investments in digital infrastructure and devices, as well as capacity-building initiatives. Additionally, EdTech costs entail initial investments as well as recurrent and hidden costs that cover things such as maintenance and upkeep. There is evidence to suggest that initial investment usually accounts for less than 25% of total costs, which can be misleading when developing budgets for EdTech.[33] Considering diverse funding sources to cover the entire lifecycle of an EdTech implementation is essential to ensure sustainability.

Areas for further exploration

This section poses some outstanding questions and areas for further exploration with which EdTech Hub is actively engaging in work on national EdTech strategies and their successful implementation.

Understanding the accurate costs of EdTech strategies

In addition to covering the costs associated with EdTech procurement and utilisation, successful implementation of an EdTech strategy requires a sufficient budget for additional activities. Such activities include teacher training and professional development, curricular revisions, and other systemic amendments needed for the comprehensive integration of EdTech into teaching and learning.[34] If the full cost of an EdTech strategy is not accurately estimated and sufficiently budgeted for, serious problems are likely to occur during implementation. Policymakers should carry out an audit of existing funds and EdTech resources at national, sub-national, and local levels and explore how they can be repurposed, revised, or increased to meet the demands of the EdTech strategy. It is advisable to align the estimated budget with diverse funding sources to ensure cost-effectiveness and sustainability.[35]

Additionally, there is a growing body of practical research on what works, when, and in what contexts, as well as on cost-effectiveness. Information on the cost-effectiveness of EdTech investments plays a crucial role in decision-making. The Global Education Evidence Advisory Panel's (GEEAP) 2023 report on cost-effective approaches to improving global learning highlights the potential of investments in EdTech to support personalised learning and the opportunity to leverage mobile phones to support teaching and learning.[36] These areas are noted as requiring further

evidence and can benefit from more rigorous exploration.

How can governments develop dynamic and iterative strategies?

Given the rapidly changing nature of technology, the implementation of EdTech interventions is better served by an agile approach than a traditional one. As discussed earlier, an agile approach is iterative, flexible, and adaptable. A key part of an agile approach is to use up-to-date data to inform strategic decision-making through small-scale iteration cycles.[37] This calls for robust data collection through adaptive M&E tools. It is crucial to ensure regular M&E processes are built into the roll-out of the strategy and that they accommodate and facilitate changes based on insights that arise during these processes.

It is also important to recognise that with constant changes in the EdTech space, knowledge gaps must be bridged through continuous research. Governments would benefit from investing in research efforts that can generate evidence and lessons to inform strategy iteration.

However, the question remains, with national policies and budgets being managed and implemented using more traditional approaches, how can policymakers ensure EdTech strategies stay relevant against the backdrop of an evolving EdTech ecosystem while also aligning with traditional governing structures?

What role can private sector partnerships play in the successful implementation of EdTech strategies?

Across various contexts, the private sector has played a pivotal role in advancing technology, including EdTech.[38] As such, it would be strategic for policymakers to consider the role of the private sector in EdTech strategy development and implementation, possibly through a public-private partnership (PPP). A PPP is a partnership between the public sector and the private sector for the purpose of delivering a project or service traditionally provided by the public sector.[39] PPPs can offer various ways in which the public and private sectors can complement each other's strengths in providing education services and improving learning outcomes. At the core of PPPs are two key concepts: risk sharing and complementarity.[40]

The experience of the Covid-19 pandemic has shown that EdTech PPPs can play an important role in delivering effective educational outcomes through enhanced knowledge transfer and cost-sharing.[41] EdTech PPPs can, however, present some risks and challenges, namely:

- Partnerships can become more expensive and more time-consuming than initially anticipated by governments.[42]
- Partnerships may not be learner-centric and, as such, might benefit the private

companies involved more than they do the learners.[43]

- There is also a risk of governments accepting inappropriate technologies and content simply for the sake of convenience.[44]

Thus, there is a demonstrated need to better understand how governments can be supported to engage in meaningful and mutually beneficial partnerships with private sector partners to better implement EdTech interventions. It is important to note that private-sector partnerships are not appropriate in every context and should be pursued only if there are clear benefits to schools, teachers, and learners, illustrating the need for further exploration of such engagements.

Beyond PPPs, working with governments on the ground has revealed the need to provide schools and ministries of education with support and guidance to make informed decisions when deliberating EdTech options. There is much to be explored on how private-sector providers can be encouraged to demonstrate the efficacy of their products, and how education ministers can better assess the success of potential partnerships.

Conclusion

This brief discusses the importance of national EdTech strategies and the process of developing such strategies and associated documents. Governments, and more specifically, ministries of education, should prioritise consultative processes of strategy development while focusing on multi-modal, problem-driven EdTech solutions and interventions guided by a unifying educational goal.

Notably, as countries move on from creating EdTech strategies to EdTech implementation, it is vital to consider how best to ensure sustained and impactful implementation. Further exploration into accurate costing of EdTech, deployment of iterative approaches, and strategic engagement of private-sector partnerships present opportunities to better support ministries of education and other on-the-ground stakeholders to leverage the full potential of EdTech to enhance learning outcomes sustainably. Strategies which are not rooted in lived realities and actionable changes at the local level have little hope of impacting learning outcomes at the national level. Political stakeholders must continue to form operational strategies in collaboration with teachers, parents, and community leaders who champion the learning of students in their communities.

Resources

Resources on EdTech policy development

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Notes

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