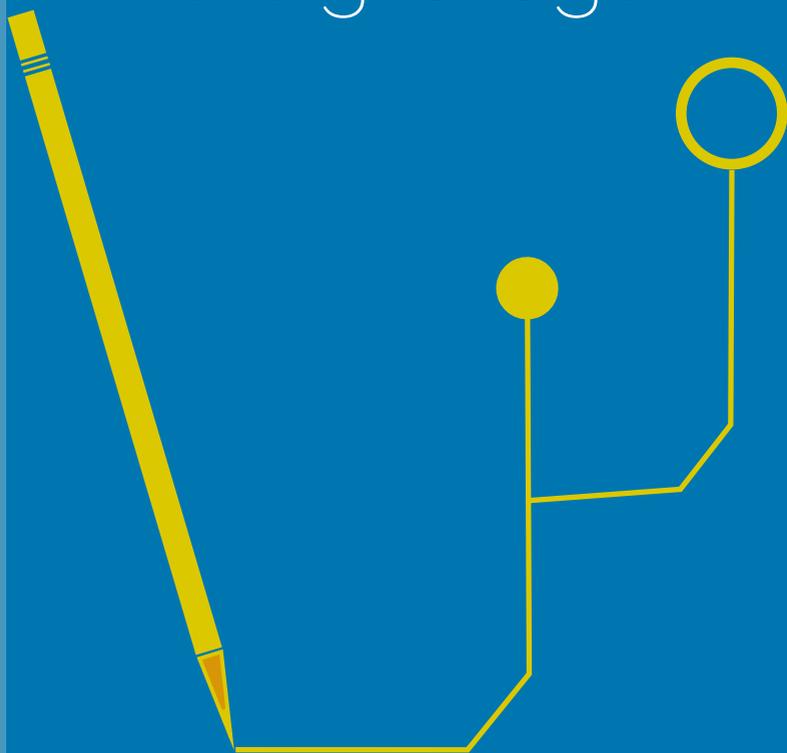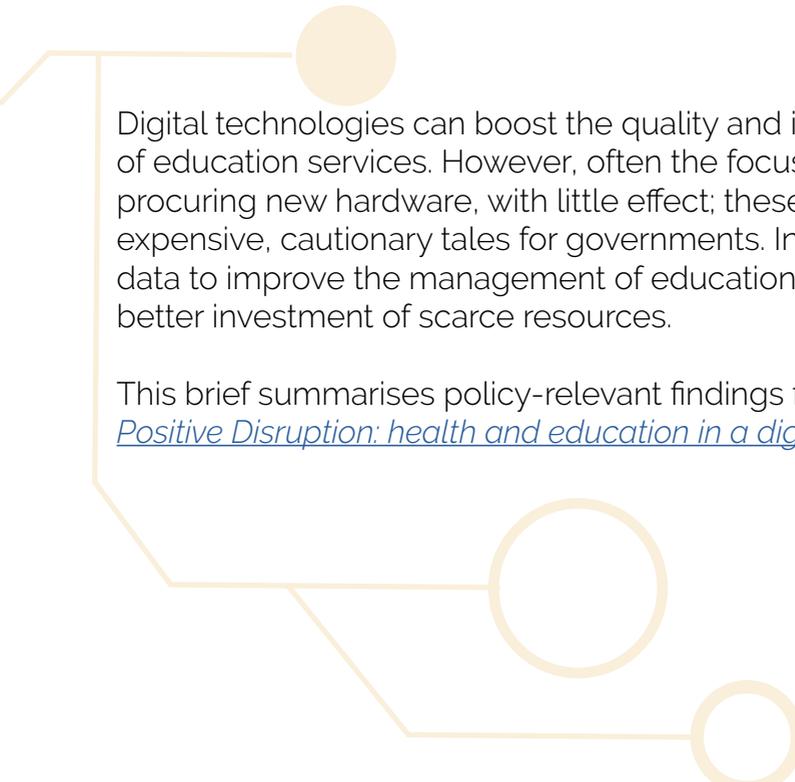# Managing education in the digital age

Policy brief

Digital technologies can boost the quality and inclusiveness of education services. However, often the focus has been on procuring new hardware, with little effect; these then become expensive, cautionary tales for governments. Instead, using data to improve the management of education systems is a better investment of scarce resources.

This brief summarises policy-relevant findings from the report *Positive Disruption: health and education in a digital age.*
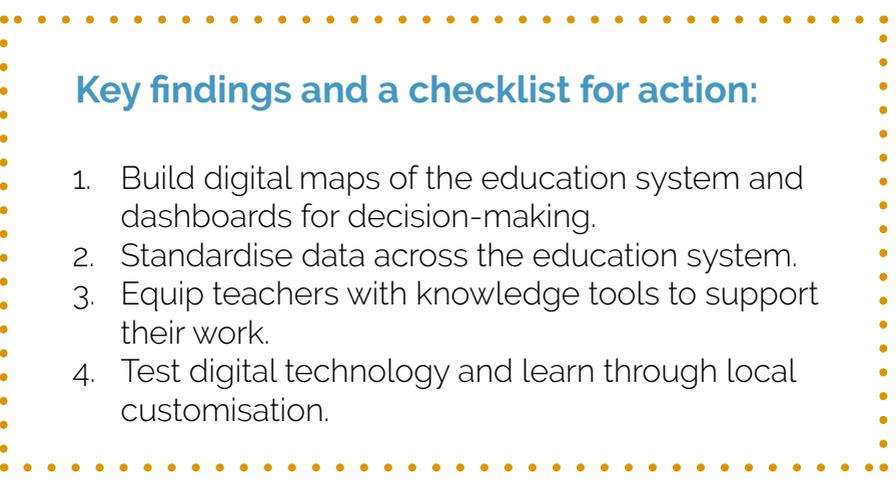
Key findings and a checklist for action:

1. Build digital maps of the education system and dashboards for decision-making.
2. Standardise data across the education system.
3. Equip teachers with knowledge tools to support their work.
4. Test digital technology and learn through local customisation.

Research findings
key principles

The allocated budget for education is not the only determinant of education outcomes; issues in the broader system can have an effect. For instance, children in Angola and Gabon spend the same amount of time in school, but achieve different learning: 4.3 and 6 equivalent years respectively.

Technology can help improve education systems, provided that countries follow a set of simple principles:

1. Technology should only be deployed where it offers an appropriate and cost-effective solution. Identify what is holding back your education system, and invest in solutions for that specific problem.

2. Good content and connections are as important as hardware, if not more so. Investing in shiny new hardware – eg putting a tablet in the hands of every student or teacher – will only help if the underlying systems support learning.

3. To be useful, technology must be supported by digital building blocks: back-end infrastructure, technical standards, and platforms.

| Data standards | Digital plumbing | Microservices and interoperability | Governance and privacy |

Future building blocks

4. Deliberate design effort is required to ensure that new technologies benefit everyone – even those typically left behind. Technologies such as adaptive learning software (eg Mindspark and onebillion) that can be customised for the most marginalised communities show promise to help struggling students.

With careful investments, these principles could help **reimagine the architectures of service delivery to improve learning outcomes for students. Current trends point towards five future visions for technological transformation of education to improve the quality of education they receive:**

- **Learning systems:** real-time feedback loops across the system will inform and improve teaching and decision-making for education professionals

- **Proactive systems:** adaptive learning software will proactively identify at-risk students, allowing teachers to target specific learning needs.

- **Personalised systems:** data analysis will make tailored learning possible for every student's needs.

- **Virtual systems:** two-way videoconferencing will break down the walls of the classroom, bringing high-quality learning to everyone, everywhere.

- **Changing roles of teachers:** as many routine tasks are automated, teachers will have more time to engage with students.

Recommendations
a checklist for action

These four recommendations are a checklist for policymakers. They represent "quick wins" that should be possible to pursue immediately. Implementing these recommendations is the first step towards an education system that aligns with the principles described earlier, and can put a country on track to tap into the immense potential of digital technology to improve learning for all.

1. **Build digital maps of the education system and dashboards for decision-making.**
The digital age is powered by data, but data only has impact if it provides insights or supports decision-making. Education ministries should create system-wide maps, dashboards, or other tools for real-time monitoring of key indicators. This could be used to monitor infrastructure and personnel (such as Ghana Schools Map) as well as learning outcomes (such as VISHWAS in India). This is a relatively low-cost way to understand performance, and identify priorities for timely resource allocation. To extend the impact, make this administrative data open and accessible to help providers, entrepreneurs and local communities contribute to improving education.

2. **Standardise data across the education system.**
Policymakers are usually able to set parameters for how data is gathered across the system. Standardising how data is collected, stored, used, and protected is a crucial priority. To generate system-wide insights, data must be consistent between schools and districts. India provides a good example; its VISHWAS platform is creating a standardised way to collect consistent education data across schools. Education ministers can also be powerful advocates in cabinet for standardising approaches to data protection across the whole of government – a crucial issue that requires coordinated policy.
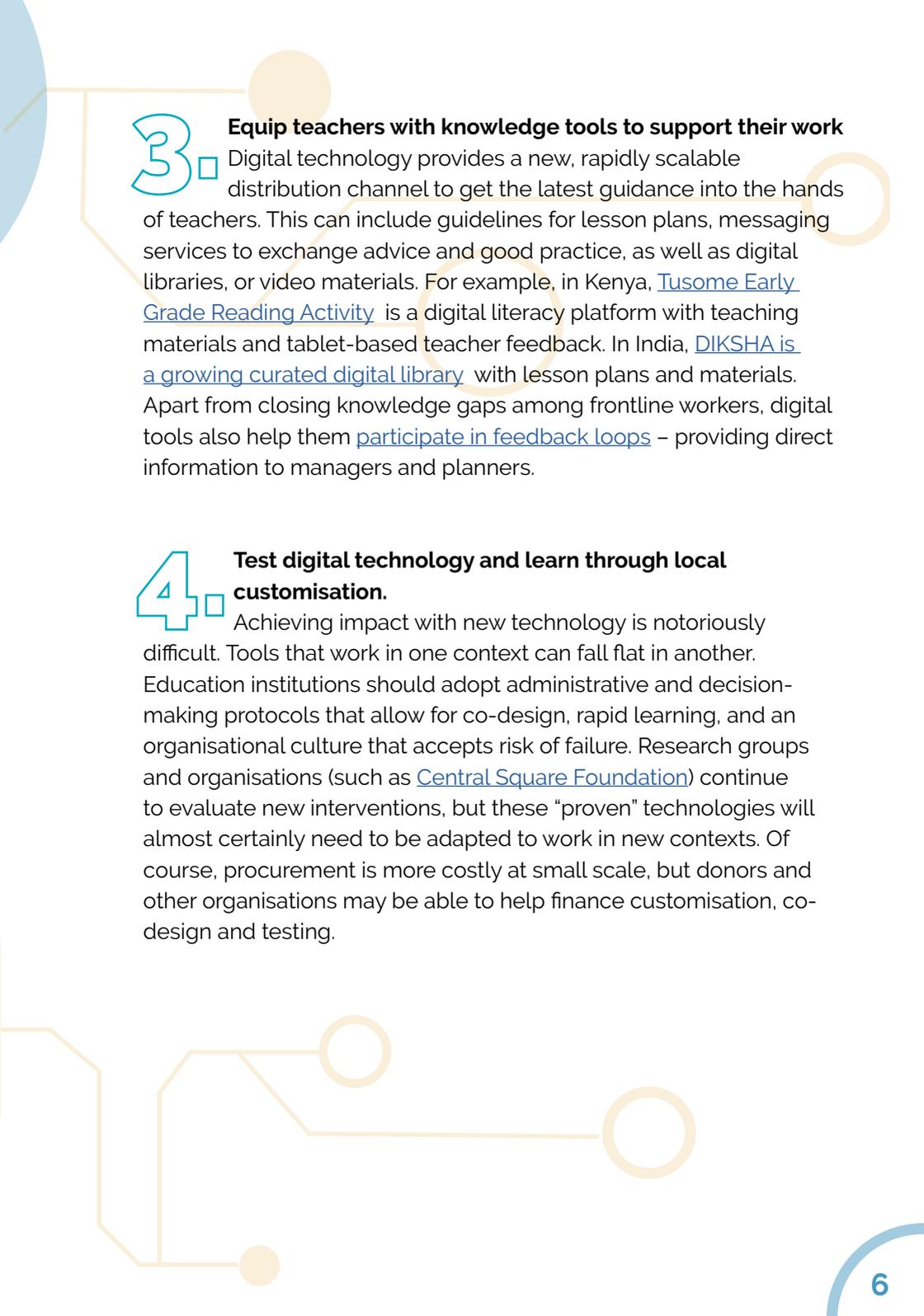
3. **Equip teachers with knowledge tools to support their work**
Digital technology provides a new, rapidly scalable distribution channel to get the latest guidance into the hands of teachers. This can include guidelines for lesson plans, messaging services to exchange advice and good practice, as well as digital libraries, or video materials. For example, in Kenya, Tusome Early Grade Reading Activity is a digital literacy platform with teaching materials and tablet-based teacher feedback. In India, DIKSHA is a growing curated digital library with lesson plans and materials. Apart from closing knowledge gaps among frontline workers, digital tools also help them participate in feedback loops – providing direct information to managers and planners.

4. **Test digital technology and learn through local customisation.**
Achieving impact with new technology is notoriously difficult. Tools that work in one context can fall flat in another. Education institutions should adopt administrative and decision-making protocols that allow for co-design, rapid learning, and an organisational culture that accepts risk of failure. Research groups and organisations (such as Central Square Foundation) continue to evaluate new interventions, but these "proven" technologies will almost certainly need to be adapted to work in new contexts. Of course, procurement is more costly at small scale, but donors and other organisations may be able to help finance customisation, co-design and testing.

About the Pathways for Prosperity Commission

The Pathways for Prosperity Commission on Technology and Inclusive Development is led by a diverse group of commissioners from government, the private sector and academia. The Commission is based at the Blavatnik School of Government, University of Oxford. We collaborate with partners around the world to produce cutting-edge research, aiming to catalyse action so that frontier technologies work for the benefit of the world's poorest and most marginalised men and women.