WHAT TECHNOLOGY CAN AND CAN'T DO FOR EDUCATION

A COMPARISON OF 5 STORIES OF SUCCESS

The world is currently engaging in the biggest distance learning experiment in history. In the time of crisis, education depends on technology.

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No country prepared for this crisis, but some seemed to experience less damage than others. Why?

What allowed them to better respond and flexibly adapt to new circumstances? **What can other countries learn from them?**

This report examined **Finland**, **Korea**, **Uruguay**, **Estonia**, and to a lesser extent, the **United States**, how these countries engaged in EdTech reforms.

Findings uncovered that EdTech reforms require a systemic change and that technology is only one aspect of the reform.

The results illustrate that countries followed both different and overlapping paths:

- **Korea** has centered the reform on the advancements in technology, whereas **Finland** has focused on the skill acquisition.

- **Estonia** and **Uruguay** executed reforms decades later than the other two but quickly caught up by tailoring experiences of others to their needs.

There is no one size fits all to education reforms, yet commonalities exist:

- ✓ Established a **clear vision** to achieve socio-economic growth.

- ✓ Defined **clear implementation strategies**.

- ✓ Designed corresponding **institutional architecture**.

- ✓ Assumed a **sequential approach**, heavily frontloading the investments in connectivity and devices.

HOW **WERE #EDTECH** REFORMS IMPLEMENTED IN **FOUR COUNTRIES?**

Connectivity and Devices

Teacher Training

Online Learning Platform

Digital Skill

Transversal Skill

YEARS

Uruguay

Focus on **connectivity and devices** (CEIBAL Phase 1)

Focus on **teacher training and online platform** (CEIBAL Phase 2)

Focus on **21st century skills and coding** (CEIBAL Phase 3)

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Estonia

Focus on **infrastructure**, **teacher training**, and **e-learning materials** (TigerLeap)

Focus on **digital skills** of students and teachers (TigerLeap Plus)

Coding instruction made compulsory beginning in grade 1 (ProgeTiger)

Technology infused into **lifelong learning** (Digital Focus)

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Korea

Computer education introduced at all levels of education

Focus on **infrastructure** and **teacher training** (MP1)

Focus on **online platform** development (MP2)

Revised **curriculum and digital textbooks** introduced (MP3)

Focus on adaptive learning **and 21st century skills** (MP4)

Coding instruction made compulsory beginning in grade 5 (MP5)

Humanistic and future-oriented approach to education adopted (MP6)

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Finland

Computers introduced in education

Reform introducing **ICT-based learning**, with emphasis on **teacher training**, adopted

Reform focused on developing **knowledge** and **skills for the information society** adopted

Reform focused on developing **transversal skills**, **including ICT competence**, adopted

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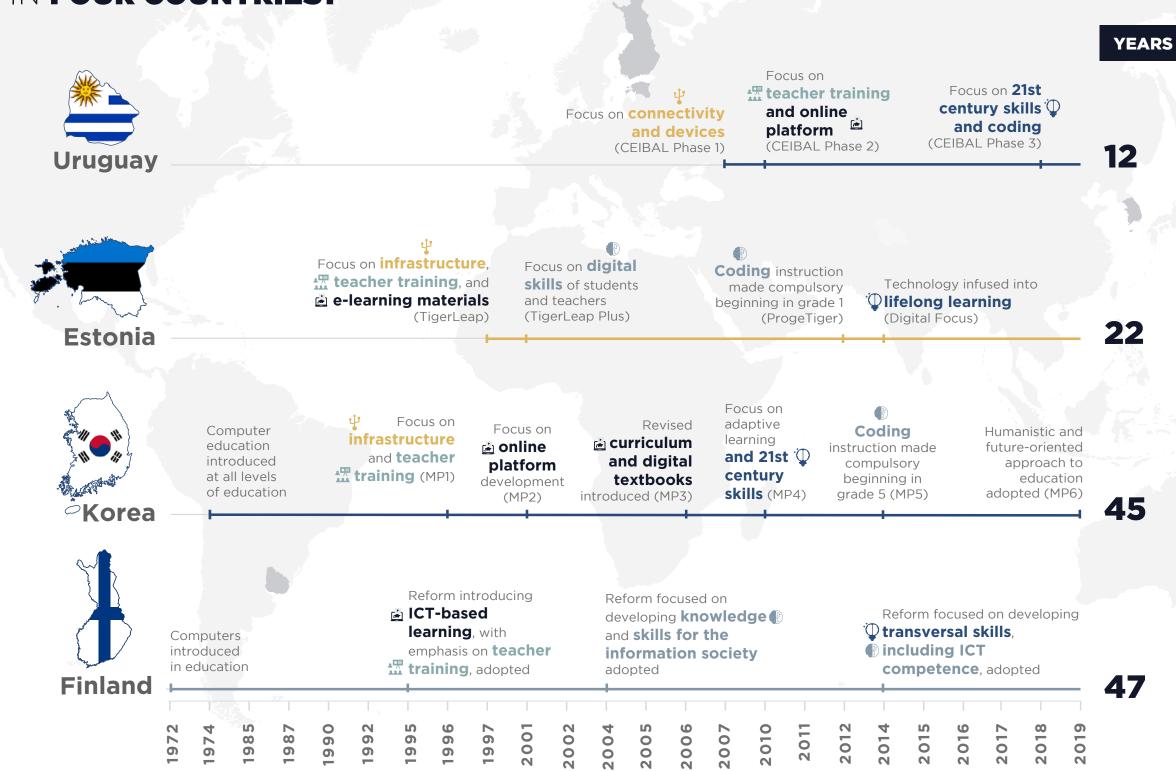
WHAT WERE THE BENEFITS THAT THESE COUNTRIES ENJOYED BY SUCCESSFULLY INTEGRATING TECHNOLOGY INTO EDUCATION?

What **can technology** do for **education?**

1 Narrow the digital divide. Due to the success of one laptop per child (OLPC) policy in Uruguay, in 2017, the access to computers ranged from 90 to 99% across all income groups.

2 Diversify tools for learning. The updated digital textbook in Korea incorporates augmented reality and gamification to teach social studies and science in elementary schools.

3 Provide personalized learning. Technology promises customized learning to take place in public education. The Smart Learning project in Helsinki incorporates digital analytics to allow learning to progress at an individual pace.

4 Better develop traditional and transversal skills. In Uruguay, students learn English from teachers connected by videoconference from the United Kingdom. In Estonia, coding education is compulsory since the 1st grade.

5 Strengthen teachers' professional development. The online platform for teachers in Estonia provides a space where they can interact and share teaching materials, creating a community for a collaborative professional development.

6 Improve efficiency in school and classroom management. Korea's National Education Information System (NEIS) transferred all administrative tasks and information online, reducing the amount of paperwork for all members of the school community.

7 Gather data and generate information. The learning management system can help teachers/school leaders identify gaps in student learning and better respond to at-risk students.

What **can't technology** do for **education?**

1 Generate a shared vision. Visions are crafted and drawn from specific contexts. Finland set its vision to capitalize on the practical application of technology in a global economy led by technology powerhouses like China and the United States.

2 Achieve social equity and inclusion. Unless equity and inclusion are core to the strategy, technology will not improve them. Uruguay's OLPC policy established the two aspects as a guiding vision which allowed for it to close the digital divide nationwide.

3 Improve learning. According to J-PAL, the access to connectivity and digital devices does not improve academic outcomes; however, it does positively impact computer proficiency.

4 Make implementation successful. All four countries executed reforms with a clear strategy. Korea and Uruguay took a sequential approach while Estonia carried out more simultaneously. Finland defined stages and centered reforms on skills.

5 Change the institutional architecture. All four countries designed an institutional architecture that best corresponded to the implementation strategy. Given the backdrop were born KERIS in Korea, CEIBAL in Uruguay, and TigerLeap Foundation in Estonia.

6 Empower teachers to become agents of change. The Finnish National Agency for Education, the executing agency of reforms in Finland, includes teachers as part of its board members. Teachers are actively engaged in the reform process and are perceived as experts and agents of change.

7 Provide support and ensure students' well-being. With the rising uncertainty and rapid changes in the 21st Century, students need socio-emotional support. Technology can free up instructional time for teachers so that more time can be spent on student counseling and mentoring.

HOW TO IMPLEMENT REFORMS: THE BASICS

Below are ten implementation basics for EdTech reforms to yield successful student learning outcomes.

Address ethical issues.
Ethical issues include the use of student data (personal/academic), respect and safety in the cyberspace, and intellectual property concerning the ownership of knowledge.

Make the reform about learning.
Technology is just a means to an end. Reform must be shaped around skills and how schools develop them for all individuals. Without such an approach, technology may exacerbate the learning divide.
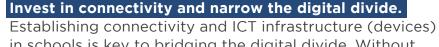
Monitor and evaluate progress and collect evidence for policymaking. Plugged or unplugged? Online, offline, or blended? More evidence needs to be collected to improve policymaking on the effective use of technology in teaching and learning.

Invest in connectivity and narrow the digital divide.
Establishing connectivity and ICT infrastructure (devices) in schools is key to bridging the digital divide. Without technology, there is no transformation.

Empower teachers to become agents of change.
Reformers must offer opportunities for teachers to develop professionally and continue learning. The role of the teacher should be less that of an instructor and more that of an analyst, designer, and facilitator.

Base the reform on a vision.
A vision is a goal that is contextualized and realistic. It is achieved over the long run, not under a particular administration.

Change what students learn, by updating the curriculum based on the skills relevant for the 21st century. The new curriculum needs to be interdisciplinary, and centered on 21st century skills, helping students learn to learn, develop digital and socioemotional skills, and learn throughout their lifetime.

Define an implementation strategy and institutional architecture. Policymakers need to design a clear execution strategy, adapt to the country's realities, and define an institutional architecture that can efficiently and effectively carry out the plan.

Change how students learn, by updating pedagogical practices in traditional subjects. Advancements in technology such as machine learning and gamification can help students better engage in the learning process and offer new venues for personalized learning.

Ensure buy-in from all stakeholders in the education system.
The spirit of the reform and the efforts required to transform education, need to permeate every stakeholder, so that they translate into improvements in learning.

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QUALITY LEARNING FOR ALL IN AND OUT OF SCHOOL

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