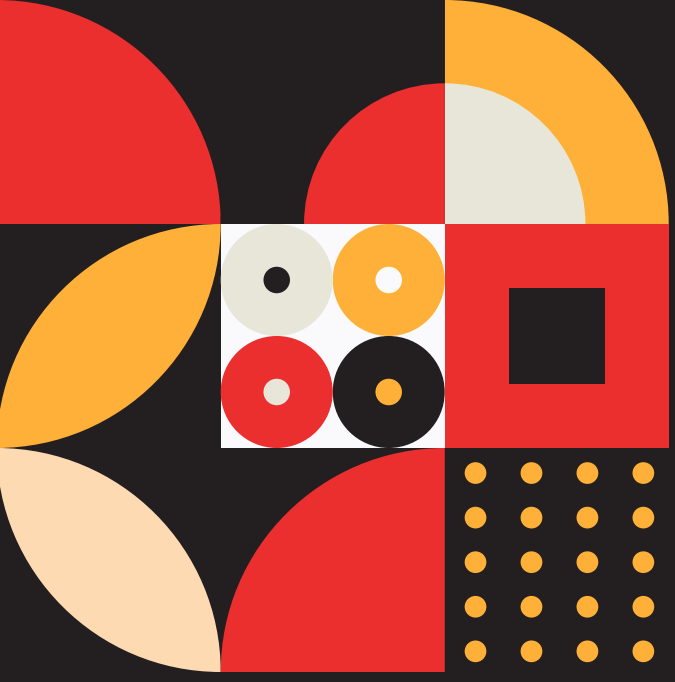
unesco

Mahatma Gandhi Institute of Education for Peace and Sustainable Development

TRANSFORMING EDUCATION - THE DIGITAL READINESS INDEX

A Pilot Case Study of the **Kyrgyz Republic**

Executive Summary



Attribution

This publication can be cited as follows: UNESCO MGIEP (2022). Transforming Education - The Digital Readiness Index, A Pilot Case Study of the Kyrgyz Republic: Executive Summary. New Delhi: UNESCO MGIEP.

ACKNOWLEDGEMENTS

The executive summary was prepared at UNESCO MGIEP by Mayank Sharma, Associate National Project Officer – Data Science and Sonal Chheda, National Project Officer – Policy. José-Luis Álvarez-Galván, Head of Policy and Advocacy Section, provided review and supervised the finalization of the document. Anantha Kumar Duraiappah, Director, provided overall guidance for the execution of the study.

We gratefully acknowledge the Communications Team at UNESCO MGIEP and Aspire Design for the design and layout of this document.

INTRODUCTION

LEARNING POVERTY HAS RISEN FROM 57% IN 2015 TO ALMOST

70%

AFTER THE PANDEMIC

The COVID-19 crisis and its associated policy responses, such as strict lockdowns, exposed how little prepared education systems are for a transition to online or hybrid learning. For example, a 2021 UNICEF study[1] found that countries with the longest school closures also had a very low proportion of students with reliable fixed internet at home.

This lack of access to devices and the internet, inadequate learning engagement with peers and teachers, and a lack of guidance on navigating digital technology meant that learners struggled to cope with the demands of remote online learning.[2] This has resulted in a further aggravation of an already burgeoning learning poverty3 crisis among students from low- and middle-income countries (with projections suggesting that learning poverty has risen from 57% in 2015 to almost 70% after the pandemic4).

As such, the deployment of remote learning methods in the face of school closures mostly reveals the often uncoordinated nature of these emergency responses. Going forward, it is important to gauge the digital readiness of education systems, especially through the lenses of equity and inclusiveness, to avoid the adverse impact of piecemeal policy responses such as the shelter-in-place orders on learners from low socio-economic communities.[5]

The digital readiness of an education system is its preparedness to deliver a digital learning experience to students and allow them to benefit from such an intervention. Digital readiness depends on many factors, such as the readiness of the technology infrastructure, i.e., the integration of Information and Communication Technology (ICT), the quality of digital content, school or education institution readiness, and human capacity – particularly the teachers' pedagogical readiness, the home learning environment and the overall education policy climate, which serve as catalysts for the adoption of digital pedagogy.

AIM OF THE STUDY

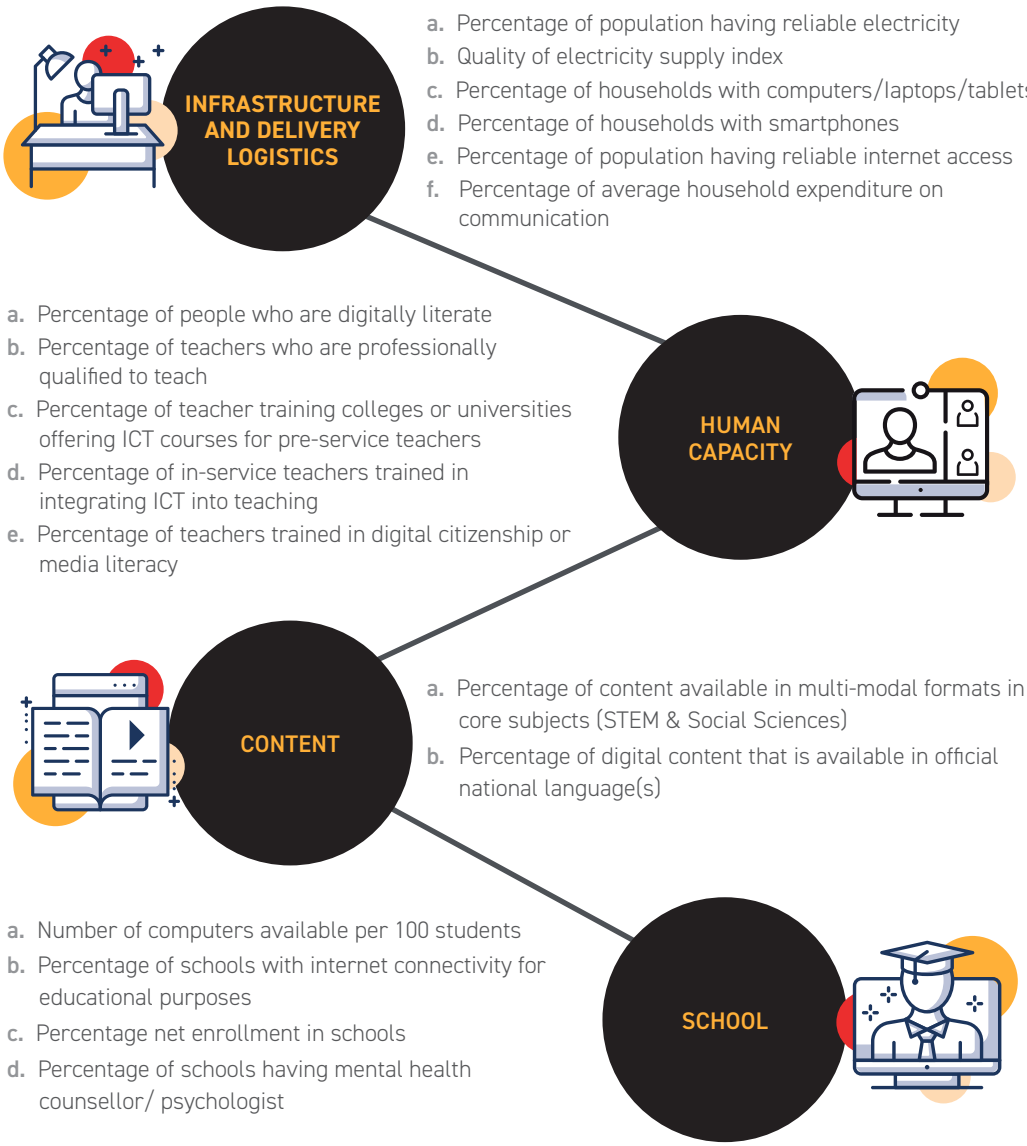
UNESCO MGIEP's Digital Readiness Index (DRI) study aims to develop a readiness framework within the education sector through a supply chain model which enables study of the delivery of learning experiences and their distribution to learners systematically[6] within a country. Compared to traditional index-based studies, the DRI framework moves away from ranking-based comparisons and sets a country as its own benchmark to evaluate its digital readiness.

The larger goal of the study is to provide decision makers with a snapshot of the bottlenecks in the current digital education supply chain, and to project future growth possibilities based on decision makers' current priorities and investments in infrastructure, personnel development, content development, and the addressing of equity issues in education.

METHODOLOGY

The digital readiness framework consists of four pillars – Infrastructure and Delivery Logistics, Human Capacity, Content, and Schools – encompassing 17 numerical indicators. These indicators have been collected through a literature review of peer-reviewed journal articles on digital education, surveys on teacher readiness for ICT integration, and grey literature comprising government reports and policy documents (see Figure 1).

FIGURE 1. UNESCO MGIEP's Digital Readiness Framework



The indicators are aggregated to calculate a DRI value using **quadratic tracking functions**, famously used in economic modelling and analysis to estimate deviations between the current and desired trajectories of various systems. The study calculates DRI values through two different scenarios, by assigning budgeted weights (preferences for each pillar estimated from current government expenditures) and equal weights (preferences for each pillar valued equally) to the supply chain pillars, respectively.

METHODOLOGICAL NOTE

The DRI values are a combination of weights and deviations in pillar trajectories. The weights applied to the different pillars reflect the relative importance placed on each pillar.

In the first scenario, the DRI is calculated with weights reflecting the current spending of the government on the four pillars to reveal the country's policy preference towards digital readiness.

However, the objective of adopting the supply chain framework is to identify bottlenecks that hamper the smooth delivery of online learning. Thus, equal emphasis needs to be placed on each pillar to avoid the domino effect of bottlenecks on the subsequent pillars.

In the second scenario, the DRI values are calculated with equal importance given to each pillar while assigning weights to reveal the bottlenecks in the delivery of online learning.

The DRI values range between (0,1), with

0 INDICATES **FULL DIGITAL READINESS**

1 INDICATES **NO DIGITAL READINESS**

Along with the DRI values, a budgetary analysis is presented using the already available and estimated costs of various supply chain indicators to provide spending estimates that may yield the best returns on investment for policy makers. The findings are contextualized through a social and economic analysis of the policy regulations existing in the country.

COUNTRY IN FOCUS

THE KYRGYZ REPUBLIC

The Kyrgyz Republic ranks 120 out of 189 countries on the Human Development Index (HDI). The country has endeavoured to achieve regional development and modernization with the aid of a digital transformation program. This program, outlined in both the National Development Strategy 2018–40 and in the 'Sanarip Kyrgyzstan' (Digital Kyrgyzstan) strategy, emphasizes the need to improve educational standards and the knowledge and skills of learners for overall human capital development, with the end goal being that of a successful digital economy.

Moreover, the Program for the Development of Education in the Kyrgyz Republic for 2021–40, underscores the importance of policy measures for the development of a digital environment, digital learning, and access to educational resources, both in school and at home. These national programs, combined with a fast-growing IT (Information Technology) sector, reflect the country's thrust on the development of a digital future.

RESULTS

*At budget weighting, the overall DRI value is **0.2117**; while, at equal weighting, the value stands at **0.2014**.*

Budget Weighting

At budget weighting, the Content pillar appears to be the strongest. This is because it has a low deviation from the desired trajectory, explained by the availability of online content in both national languages. In comparison, the Schools pillar appears to be the weakest in the supply chain. This disposition can be explained by the capital-intensive nature of school infrastructure investments.

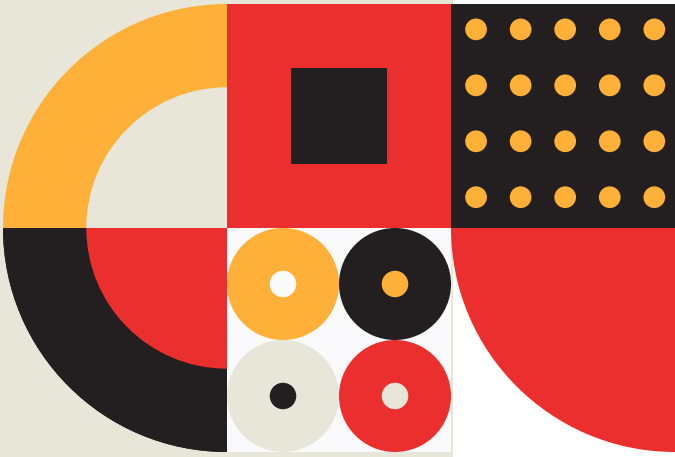
Equal Weighting

At equal weighting, the Infrastructure pillar appears to emerge the strongest whereas the Schools pillar remains the weakest, indicating the small and large deviations from the desired trajectories in these pillars, respectively. Low deviations in the Infrastructure pillar are a result of high rates of electrification, smartphone access, and internet penetration. Contrastingly, high deviation in the Schools pillar is the result of fewer devices per 100 students and less than 10% of schools having access to dedicated mental health professionals.

The DRI at equal weighting appears to be better than budget weighting at reflecting the low deviations in the Content and Infrastructure pillars, respectively. These pillars contribute to the overall improvement in DRI scores as equal weight is assigned to them. However, we must recognize that in the equal weighting scenario, the allocations are made equally and may not necessarily address the needs of the supply chain.

Through a budgetary analysis, it was revealed that if Kyrgyzstan, from its current allocation of **173.49 million KGS (Kyrgyzstani Som)**, increased its supply chain budget by **95 billion KGS[7] (546x)**, it would be able to achieve a perfect DRI score of 0. The results and major recommendations (according to each pillar) are summarized in Table 1.

FUTURE SCOPE



This exercise provides some initial findings that are hopefully useful for policy makers as they strive to improve their digital learning space. The analysis has highlighted the need to take an intersectoral approach to ensure that bottlenecks do not emerge in the delivery process. Therefore, a more holistic picture of readiness also requires that the pillars be considered in tandem rather than disparately.

The exercise also alerts education policy makers to the importance of collecting data across the supply chain to provide a clearer picture of where and when investment is needed to maximize the return on investment in education for the future.

Endnotes

1 UNICEF. (2021). COVID 19 and School Closures: One Year of Education Disruption. UNICEF. https://data.unicef.org/wp-content/uploads/2021/03/COVID19-and-school-closures.pdf
2 OECD. (2022). Mending the Education Divide: Getting Strong Teachers to Schools that Need them the Most. TALIS, OECD. https://doi.org/10.1787/92b75874-en
3 Share of children who cannot read a simple text with comprehension by age 10
4 The State of Global Learning Poverty: 2022 Update, World Bank (2022)
5 See https://en.unesco.org/covid19/educationresponse/consequences on the adverse consequences of school closures
6 The DRI study is inspired by supply chain models used in economics and borrows terminology from the conventional lexicon used in such models.
7 Approximate, conservative estimate (see full report for calculations)

Table 1. Results and recommendations at a glance (The Kyrgyz Republic)

Pillar	DRI (BW[A])	DRI (EW[B])	Strengths	Areas to Improve
Infrastructure & Delivery Logistics	0.0283	0.0233	• Near complete electrification • Reliable internet access	• Access to good quality and affordable computable devices • Broadband penetration to remote and rural areas • Equity gaps in the education system • Quality of electricity
Human Capacity	0.0781	0.0691	The Kyrgyz Republic Informatics Framework recognizes 'information competence' as a key aptitude in the State Education Standard of secondary school education (MoES, 2014),[8] largely focusing on 'Media and Information Literacy' and 'Content Creation and Computational Literacy', both of which are key components of digital literacy	• Individual readiness (teacher and learner level) • Gaps in enhancing digital and media literacy • Access, reach and affordability of Continuous Development Programs • Curriculum designed for teacher education (including digital tools) • Quality and access of professional development and in-service programs • Collection of granular-level data on in-service training
Content	0.0153	0.0352	• Digital content available in local languages • Emphasis on local production of digital content and use of Open Educational Resources (OERs)	• Skew in availability for non-STEM (science, technology, engineering and mathematics) subjects curricula • Availability of Universal Design for Learning (UDL) aligned content for all areas of learning
Schools	0.0900	0.0739	• High enrollment rates • Focus on improving internet connectivity in school	• Gaps in internet access to remote areas • No. devices per 100 learners • Social and emotional well-being of students

[A] Budget weight
[B] Equal weight
[C] Calculating returns on investment of 1 billion KGS in each pillar
[8] Ministry of Education and Science of the Kyrgyz Republic (MoES). (2014). State Educational Standard of Secondary School Education of the Kyrgyz Republic. http://old.edu.gov.kg/ru/schools/gosudarstvennyj-obrazovatelnyj-standart

ROI Analysis[c]	Recommendations
DRI value improves from **0.2117** to **0.2105** (a very small increase). This is because this pillar requires the bulk of the estimated budget to reach its desired trajectories  **0.2117** **0.2105**	• Plug the gaps in access to devices through subsidies, cashback, etc. • Plug the gaps in access to the internet via partnerships with telecom companies • Use foreign investment funds and donor agencies to address disparities in rural areas
DRI value improves the most here, from **0.2117** to **0.1336** (because this pillar requires only an additional 275 million KGS to be fully ready)  **0.2117** **0.1336**	• Create a development plan for: - Capacity building of educational personnel - Reforms in teacher recruitment - Increasing the number of teacher training centres, colleges, etc. - Training policy makers to collect disaggregated data for better decisions • Allocate adequate budget to aid the shift in focus from basic pedagogical readiness to include training in meaningfully integrated digital pedagogy within the classroom
DRI value improves from **0.2117** to **0.1963** (this pillar is not as capital intensive, with only 18 million KGS required for complete digital transformation)  **0.2117** **0.1963**	• Ensure greater availability of UDL-aligned content in non-STEM subjects • Provide for device and internet access • Perform quality assurance on digital learning content, platforms, etc. • Innovate partnerships for training local staff in creating multi-modal content, in alignment with UDL principles
DRI improves from **0.2117** to **0.2078** (a small change due to the capital-intensive nature of the pillar)  **0.2848** **0.2078**	• Create affordable, community-based solutions for internet connectivity • Strategize partnerships to improve the affordability of computable devices • Mainstream social and emotional learning (SEL) within the education system • Increase the number of need-based scholarships with pre-conditions to encourage student retention

0 INDICATES **FULL DIGITAL READINESS**

1 INDICATES **NO DIGITAL READINESS**

UNESCO MGIEP's Digital Readiness Index (DRI) study aims to develop a readiness framework within the education sector through a supply chain model to study the delivery of learning experiences and their distribution to learners systematically in a country. Compared to traditional index-based studies, the DRI framework moves away from ranking-based comparisons and sets a country as its own benchmark to evaluate digital readiness.

The larger goal of the study is to provide decision makers with a snapshot of bottlenecks in the current digital education supply chain, and to project future growth possibilities based on decision makers' current priorities and investments in infrastructure, personnel development, content development and addressing equity issues in education.

The first pilot of the DRI study was conducted with six countries - the Maldives, South Africa, the Kyrgyz Republic, the Kingdom of Bhutan, Sri Lanka and Estonia.

This executive summary is a snapshot of the main findings of the larger report *Transforming Education: The Digital Readiness Index, A Pilot Case Study of the Kyrgyz Republic,* which is one of the six reports from the DRI pilot that will be released in 2023.

Scan to access executive summaries of all pilot reports: