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State of use of ICT and AI tools in education in SCO countries

Education 2030

This work is a publication produced by the UNESCO Institute for Information Technologies in Education (UNESCO IITE) within the project 'Connecting Schools Online for Intercultural Teaching and Learning: IITE UNESCO Associated Schools Network Pilot Project for Shanghai Cooperation Organization Countries' in partnership with Huashi Education Group (China).

Cover photo:
Design and layout: Oleg Belousov
Editing: Lesley Cameron
Typesetting: UNESCO IITE

Suggested citation: UNESCO IITE. 2025. *State of use of ICT and AI tools in education in SCO countries.*

PREFACE

The *State of Use of ICT and AI Tools in Education in SCO Countries* report provides an in-depth analysis of how digital tools and artificial intelligence (AI) are integrated into education across nine Shanghai Cooperation Organization (SCO) member states. Commissioned by the UNESCO Institute for Information Technologies in Education (UNESCO IITE) in collaboration with the Huashi Education Group (HEDU Group), this study highlights key trends, challenges and disparities in digital education policies and infrastructure.

A diverse team of experts contributed to this report, offering valuable insights into the varying levels of information and communication technologies (ICT) adoption, government initiatives and the role of AI in education. The study is based on a combination of quantitative data, case studies and comparative analysis, following an established research framework to ensure clarity and relevance.

With digital transformation accelerating globally, understanding these dynamics is crucial for shaping policies that foster equitable access to technology-enhanced learning. By documenting the current state of digital education in SCO countries, this report serves as a foundation for future research, collaboration and policymaking aimed at bridging digital divides and maximizing the benefits of ICT and AI in education.

FOREWORD

Digital transformation in education has moved from aspiration to necessity. Across the globe, governments are reassessing their national strategies, investing in digital infrastructure, and exploring the use of artificial intelligence and ICT to enhance access, equity, and quality of education. The use of information technologies in education is one of the key cooperation areas in the Memorandum of Understanding signed by UNESCO and Shanghai Cooperation Organization (SCO) in 2023.

In this context, the present report, The State of Use of ICT and AI Tools in Education in SCO Countries, offers a timely and comprehensive analysis of how nine member states of the Shanghai Cooperation Organization (SCO) are navigating this digital shift.

Carried out by UNESCO IITE in partnership with Huashi Education Group (HEDU Group) the report examines both the opportunities and disparities that define the region's educational technology landscape. From robust national platforms in India and Kazakhstan to smaller, donor-supported initiatives in Tajikistan, the diversity of approaches reflects unique national priorities, capacities, and constraints.

The report also highlights the growing role of AI in education – from personalized learning systems to data-driven decision-making tools – while underscoring the need for inclusive, ethical, and sustainable implementation strategies.

UNESCO IITE hopes that this publication will inform policymakers, educators, and researchers, and inspire deeper collaboration among SCO member states. By learning from one another, we can collectively shape a future in which all learners – regardless of geography or income – benefit from the transformative power of digital technologies.

Tao Zhan

Tao Zhan, Director
UNESCO IITE

ACKNOWLEDGEMENTS

This publication is the result of collaborative efforts aimed at capturing the evolving landscape of digital transformation in education across the SCO member states. It would not have been possible without the contributions of numerous individuals and institutions.

We particularly acknowledge the valuable collaboration with the Huashi Education Group (HEDU Group), whose engagement in the project supported the effective coordination of activities and exchange of expertise.

This publication reflects the collective efforts of a diverse team of researchers, analysts, and regional experts who contributed valuable insights into national strategies, infrastructure gaps, and the evolving role of AI in education. The report draws on a combination of quantitative data, country case studies, and comparative policy analysis, following a consistent research framework to ensure clarity and relevance. UNESCO IITE expresses appreciation to Dr Ahmad Keykha, (Sharif University of Technology, Iran), Airat Ishimbaev, Aybulat Aletdinov, Ilgiz Mukhitdinov, Marat Shamsimukhametov, Timur Nadyrshin (Ala-Too International University, Kyrgyzstan). Finally, sincere thanks to Natalia Amelina, Tatiana Shutova and Elizaveta Kondrashova (UNESCO IITE) for their support for the project activities and implementation, especially the priority given to the practical value of the work and to carrying it out in accordance with UNESCO regulations and guidelines, to Lesley Cameron, who provided editorial support, and to Oleg Belousov, who undertook the design and layout. The dedication to the practical impact of the study and their close attention to its quality and relevance were instrumental in its successful implementation.

UNESCO IITE sincerely thanks all contributors for their commitment to advancing digital transformation in education. This report serves as a foundation for future dialogue, research, and cooperation to promote equitable and effective use of ICT and AI in learning across the SCO region.

EXECUTIVE SUMMARY

The report The State of Use of ICT and AI Tools in Education in SCO Countries presents a comparative analysis of how digital technologies and artificial intelligence (ICT and AI) are being integrated into the education systems of nine member states of the Shanghai Cooperation Organization. Elaborated by the UNESCO Institute for Information Technologies in Education (UNESCO IITE) in cooperation with the Huashi Education Group (HEDU Group), the study responds to the increasing urgency to understand and bridge digital divides within and across countries, especially in the aftermath of the COVID-19 pandemic.

Drawing on national data, policy documents, case studies, and platform analysis, the report maps the current landscape of ICT and AI use in primary and secondary education across China, India, Kazakhstan, Kyrgyzstan, Pakistan, Russia, Tajikistan, Uzbekistan, and Iran. While these countries share certain regional and historical ties, the findings reveal considerable diversity in infrastructure readiness, policy frameworks, and implementation models.

Several countries – most notably China, India, and Kazakhstan – have demonstrated substantial progress in digitalizing education, with large-scale national platforms offering structured learning content, teacher development resources, and increasingly AI-enabled features. In contrast, other member states continue to rely heavily on donor-driven initiatives or local pilot projects, often constrained by limited infrastructure, low device access, and inconsistent internet connectivity, particularly in rural areas.

The report highlights a growing awareness across the region of the potential of AI in education. Countries such as China, Russia, and India are piloting AI applications for personalized learning, automated assessment, and policy analytics. Others, such as Uzbekistan and Kazakhstan, are beginning to integrate digital literacy and emerging technologies into national curricula. However, challenges remain in terms of regulatory readiness, ethical safeguards, and teacher preparedness for working with AI-driven tools.

Despite disparities, there is a common recognition among SCO countries that digital transformation is essential for building resilient, inclusive, and future-ready education systems. The pandemic played a catalytic role in accelerating this shift, spurring the rapid deployment of online platforms and digital resources. Yet, the pace and sustainability of these changes vary considerably.

The report concludes with a call for enhanced cooperation, knowledge sharing, and investment across the region to support equitable access to digital education. It emphasizes the importance of building robust digital ecosystems, fostering teacher capacity, ensuring ethical use of AI, and adopting coherent strategies that serve all learners, particularly those in underserved or remote areas.

By documenting current practices and identifying both achievements and gaps, this study aims to support evidence-informed policymaking and regional collaboration to ensure that ICT and AI technologies are harnessed for the benefit of all learners in the SCO region.

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INTRODUCTION

This report was commissioned by the UNESCO Institute for Information Technologies in Education (UNESCO IITE) to gather evidence and conduct an independent analysis of the state of the use of information and communication technologies (ICT) and artificial intelligence (AI) tools in education in nine Shanghai Cooperation Organization (SCO) countries: China, India, Iran, Kazakhstan, Kyrgyzstan, Pakistan, Russia, Tajikistan and Uzbekistan. Belarus joined the SCO only very recently – 4 July 2024 – and hence is not included in this report.

While these countries are geographically similar – they are located in the same part of the world, are very close to each other and have common borders – economically and politically they are very different. India has the biggest population in the world, and Kyrgyzstan has a population of only 6.9 million [1]. Russia is the largest country in the world, and Tajikistan has a land area of only 138,790 square kilometres [2]. The GDP of China was USD 17.96 trillion in 2022; that same year, the GDP of Uzbekistan was USD 90.39 billion [3].

The political and economic differences have a significant influence on how these countries approach the digital aspect of education. For example, Digital Infrastructure for Knowledge Sharing (DIKSHA), a government-funded e-learning platform in India, offers students a vast amount of content in twenty-nine national and seven other languages. Neighbouring Pakistan does not offer its learners a platform of similar scale and struggles with the problem of a significant number of out-of-school children. Some countries invest heavily in creating and maintaining their own e-learning platform, while others rely on funding from bodies such as UNICEF to provide these types of resources for their young citizens. Countries are also very different in terms of infrastructure. For example, internet speeds and the proportion of households with a computer vary significantly between countries, sometimes over one or two orders of magnitude. Those differences do not correspond to differences in geographical or population size, for example. They are rooted in other factors – perhaps better governing, better investment in education or a stronger focus on digital tools and resources.

While these factors merit further investigation, the purpose of this report was not to identify the factors that cause differences between countries, but to describe and analyze the current state of affairs. Given the diverse economic and political landscapes of the nine Shanghai Cooperation Organization (SCO) countries examined in this report, a comparative analysis provides valuable insights into the varying strategies, challenges and opportunities in digital education. Additionally, the report contributes to the broader discourse on global education equity. Differences in digital access and AI implementation can reinforce existing educational inequalities, both within and between countries. By systematically documenting the current state of digital education in SCO nations, the report provides a foundation for future research and collaboration aimed at bridging the gaps.

In this context, the report serves as a timely and essential resource for educators, policy-makers and researchers seeking to navigate the evolving landscape of ICT and AI in education across the SCO region. Its findings can inform regional and international initiatives to promote digital inclusion, ensuring that teachers and students across diverse settings benefit from technological advancements in education.

Methodology

In any project that involves comparing and contrasting a range of characteristics – in this case, the use of ICT in schools and technical and vocational training and education (TVET) institutions – it is essential to design a robust set of criteria that will direct the reader to the pertinent information without overwhelming them with data that the researcher deemed relevant and important. The project team therefore decided to adopt a proven framework for their research and subsequent report.

John Hattie's Visible Learning Framework seemed to be one of the best options. In his ground-breaking study 'Visible Learning', Hattie ranked 138 influences related to learning outcomes, from very positive to very negative effects. He found that the average effect size of all the interventions he studied was 0.40 and decided to judge the success of influences relative to this 'hinge point' in order to find an answer to the question 'What works best in education?' The framework is based on 2,100 meta-analyses comprising more than 132,000 studies involving 300 million students around the world [4], and most importantly, it looks at the use of technology in education from the influence point of view, showing both the tools that have a significant effect on learning outcomes and those that have very little, if any, effect.

The 'Technology' subdomain in Hattie's framework identifies the following factors related to student achievement with a weighted effect size of more than 0.4: smartboards, interventions for students with special educational needs (SEN), technology used by teachers working with students with SEN, mobile/touch devices/tablets, robotics, virtual reality (VR), interactive video/

multimedia, service learning, simulations, intelligent tutoring systems (ITS), ICT, web-based learning and technology use in writing and gaming.

Other factors have an effect size of less than 0.4 and some even have a negative impact, such as screen time (weighted mean effect size −0.29) or FaceTime and social media (weighted mean effect size −0.12). Taking all these factors into consideration, we drafted a preliminary list of criteria:

1. Digital initiatives (government-, privately or NGO-funded).
2. Approaches: SEN students and technology, web-based learning, bring your own device (BYOD), gaming and gamification, distance and online learning.
3. Hardware: Smartboards, mobile/touch devices/tablets, robotics, VR devices.
4. Resources: Hardware statistics, internet access and availability, teacher statistics, student statistics.
5. Software: Simulations, ITS, web-based learning, digital tools.
6. Use of AI in teaching and learning.

Upon closer examination, we realized that some items in the list overlapped. For example, digital initiatives could encompass options such as simulations, ITS, web-based learning, distance and online learning and digital tools. Another important consideration is that many of these criteria would be almost impossible to use, since the required data – for example, the proportion of ICT-proficient teachers or the percentage of schools that use VR technology – might not be available. Given the desktop nature of this study, we had to rely on freely available secondary data, rather than collecting primary data.

This left us with the following three criteria:

1. Digital initiatives (state-, privately or NGO-funded). These are analyzed mainly in the Country Profiles chapter and include many of the factors mentioned in the preliminary list – for example, web-based learning, distance and online learning platforms, and use of AI in teaching in learning (points 1, 2 and 6 of the original list).
2. Quantitative indicators. These are discussed in the Quantitative Indicators chapter and refer mainly to statistics on hardware, resource and infrastructure availability (points 3 and 4 of the original list).
3. Qualitative and quantitative indicators that describe each country's e-learning platform, portal or app in detail. These are discussed in the Case Studies chapter and correspond to points 1,2, 5 and 6 of the original list.

During the secondary data-collection stage, it became clear that while data were mostly available for schools, the same could not be said for TVET institutions. Some countries provided certain statistics, but most did not, which made comparison impossible. The scarcity of TVET-related data hindered inter-country comparison, and so it was essentially unusable.

Data on AI were equally scarce. In this case, it was because AI is an emerging technology and its wide implementation in schools will take a considerable time. Nevertheless, we tried to identify such data and have included them wherever possible.

Another important observation we made during the data analysis was that some countries had much more fundamental problems to solve before they can implement higher-order policies and solutions, such as AI or ITS. For example, electricity and internet access are challenging in Pakistan and Tajikistan, especially in rural areas [5].

About this report

This report consists of three chapters. The first chapter contains country profiles – a brief overview of each country's digital initiatives in education plus some information about the availability of SEN tools and developments in the AI field. The second chapter presents a comparison of countries using a set of quantitative criteria. The third chapter consists of nine case studies, one for each country. We decided that, from a reader's perspective, it would be more helpful – and interesting – to focus on each country's e-learning platform, portal or app rather than on a particular school or TVET institution. E-learning platforms, portals and apps give a good, detailed overview of one of the ways in which students learn using digital tools in a given country.

We obtained some of the data for this report from dynamic data sources, such as Google Trends, Data Commons and Worldometer. The dynamic nature of these sources means that the data they contain change constantly, so the figures mentioned in this report may have changed since time of writing.

The data used for the country profiles are referenced as follows: government expenditure on education (% of GDP) [6], government expenditure on education (as % of all government expenditure) [7], GDP per capita (PPP) [8] and population [9]. (See the References section.)

Google Trends data are used throughout the report to illustrate how frequently specific terms have been searched for. Instead of giving exact numbers of searches, Google Trends uses a scale from 0 to 100 to show relative popularity. These numbers show interest in a particular term relative to the highest point for that term over the selected region and period. This method allows for easy comparison of terms over different periods. A score of 100 is the peak popularity for the term; a score of 50 means that the term is half as popular. A score of 0 means there were not enough data for this term or there have been no searches for it [10].

With regards to reporting periods and data comparability, it is important to note that while data from reputable sources – the World Bank, for example – on indicators such as PPP were readily available for all countries in 2023, and data on government expenditure as a percentage of GDP were available for all countries and fairly recent (2022), it was challenging to compare countries in terms of government expenditure on education as a percentage of all government expenditure. This is a valuable indicator, but there was not a time period in which data from all countries were available. For example, the earliest data available from Tajikistan are from 2021, while the latest data from Russia are from 2020 [11]. We therefore decided to compare countries for this indicator using only 2020 data (with the notable exception of Tajikistan). We acknowledge that this constitutes a limitation of our analysis. However, the figures do at least give some indication of the current status of this expenditure. In addition, the available data show that spending as a percentage has not changed dramatically between 2020 and 2024 in any of the countries discussed in this report, so data for 2020 are still valuable [12].

ACRONYMS

AI	Artificial Intelligence
ATL	Atal Tinkering Labs (India)
AVR	Augmented Virtual Reality
CBSE	Central Board of Secondary Education (India)
CPD	Continuous Professional Development
CSS	Central Superior Services or Civil Service (Pakistan)
ECAT	Engineering College Admission Test (Pakistan)
ENT	National Matriculation Exam (Kazakhstan)
EU	European Union
GDP	Gross Domestic Product
HD	High Definition
HEI	Higher Educational Institution
iOS	iPhone Operating System
K–12	Kindergarten to Grade 12
MCAT	Medical College Admission Test (Pakistan)
MIS	Management Information System
MoE	Ministry of Education
MOOC	Massive Open Online Course
NCERT	National Council of Educational Research and Training (India)
NGO	Non-Governmental Organization
PDF	Portable Document Format
PPP	Purchasing Power Parity
SCO	Shanghai Cooperation Organization

SEN	Special Educational Needs
SIS	School Information System
TVET	Technical and Vocational Education and Training
UNICEF	United Nations Children's Fund
USD	United States Dollars
VET	Vocational Education and Training
VOUD	External Assessment of Educational Attainment (Kazakhstan)
VR	Virtual Reality

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COUNTRY PROFILES

CHINA

China is the second-most populous country in the world, with 1.41 billion people, as of 2023 [13]. With a PPP of USD 24,557.60 in 2023, which is higher than the average in SCO countries by approximately 35%, China sits comfortably in the upper-middle range for this indicator [14]. However, government expenditure on education as a percentage of GDP in 2023 was at the lower end, 4.0%, with only Iran (3.1%) and Pakistan (2.0%) having lower spending percentages [15]. It could be argued that the second-largest economy in the world – it is five times that of India and almost nine times that of Russia – could spend a lower share of its GDP on education and still get similar results.

Key messages

1. China has seen a surge in the development and use of online learning platforms following the country's push for greater digitalization and the consequences of the COVID-19 pandemic. Some key players were Tencent Classroom, VIPKid, Yuanfudao, Zuoyebang, Xueersi, 17zuoye (Homework Together) and HuJiang [16, 17].
2. Apps for language learning, exam preparation, homework assistance and supplemental instruction have become incredibly popular and are widely used among students in China. Two notable examples are Yuanfudao and Zuoyebang [18].
3. AI is used more frequently in schools, with applications in personalized learning, predictive analytics for academic performance and automated grading. For example, Squirrel AI is an adaptive learning platform used to tailor educational content to students' learning patterns.

Government initiatives

The Chinese authorities' approach to the use of ICT and AI in education has focused mostly on developing and publishing white papers, regulatory acts and guidelines, such as 'Compulsory Education Curriculum and Standards 2022'. This document's key features were its emphasis on key competencies, more holistic education, more flexible and adaptive teaching and more local content. Personalized education was to be implemented through student-centred learning, differentiated instruction and the use of technology, all of which relate directly or indirectly to the use of ICT and AI in schools.

Another key white paper, issued during the pandemic, was 'Suspending Classes Without Stopping Learning Imitative (SCWSL): COVID-19', which highlighted three main ICT-related areas: rapid transition to online education, integration of online and offline learning and collaboration with technology companies.

The government also focused directly on the use of technology in school education and vocational education. 'The Education Informatization 2.0 Action Plan', introduced in 2018, stated that the three main goals of technology in education are to make education more personalized and efficient, to improve access for all and to enhance the quality of education. The main features of this plan were an innovation-driven, not technology-driven, approach; the use of digital resources, and not static digital textbooks; and a focus on digital literacy, rather than on applied ICT skills.

Another ICT-related government initiative was the 'Smart Education of China Initiative 2022', which has driven the idea of three integrated online educational platforms: Basic Smartedu for K–12 education, Vocational Smartedu for vocational education and Chinaooc for higher education [19, 20].

Yet another initiative was the online interactive study programme implemented in public K–12 schools in Shandong Province. HSEDU, Huawei, Hikvision and China Telecom deployed an integrated solution with both hardware (such as smartboards plus AI HD camera) and software to allow thousands of teachers and millions of students to use online interactive technology to continue learning during the COVID-19 period.

Private initiatives: Before and after 2021

Before examining the effect of the government crackdown on the private education industry in 2021, it is worth looking at an example of a pre-2021 educational private initiative – the Yuanfudao (Ape Tutor) company, the first unicorn company in the Chinese K–12 online education market. Yuanfudao was a platform aimed primarily at K–12 students. It offered a comprehensive range of online courses, live lessons and homework help. Forbes named it one of the most innovative companies in China and the highest-valued EdTech start-up in the world at USD 15.5 billion [21]. The company claimed to have had more than 400 million users in 2020 [22].

However, in 2021, the regulatory landscape changed dramatically for Yuanfudao and other private education companies. The Chinese authorities stepped up restrictions on the private education industry, and companies were banned from making a profit and raising capital from stock-listing or foreign investors. Before the crackdown, the global list of EdTech unicorns comprised eight from China with a valuation of USD 1 billion or more, and only six from other countries (five from the United States of America, and one from India) [23]. By 2023, the global list of EdTech unicorns did not contain a single Chinese enterprise. Chinese companies such as Changingedu, Golden Education, Hetao101, Huohua Siwei, Huike, HuJiang, Knowbox, VIPKid, Yuanfudao, Yunxuetang and Zuoyebang all saw their valuation drop below the unicorn threshold of USD 1 billion [24].

Figure 1. Neural headband: 'Distracted' blue light

Figure 2. Neural headband: 'Deeply focused' red light

Source: The Wall Street Journal. 2020. How China is using artificial intelligence in classrooms. https://www.youtube.com/watch?v=JMLsHI8aV0g

AI in education

With regards to the use of AI in education, Chinese authorities follow an approach similar to that implemented in the ICT in education field: develop and publish regulatory guidance, set targets and let private companies operate in that environment. The main piece of regulatory guidance for AI in education is the 'New Generation of Artificial Intelligence Technology Development Plan 2017' [25]. This plan advises popularizing the use of AI in science education, recommends setting up AI-related courses in primary and secondary schools and promotes the teaching of programming in schools. The targets set in this plan are for the AI industry in China to produce a gross output of USD 140 billion by 2030 [26].

In practice, there are some initiatives at the school level, such as the use of AI-powered cameras in some schools to monitor students' use of smartphones, or neural headbands to monitor students' concentration in real time. Figures 1 and 2 show examples of how neural headbands can be used.

Squirrel AI is considered to be one of the world's leading AI in education companies. It is used in more than 60,000 state-run schools in China [27] and is an example of an intelligent adaptive approach to tailor learning to meet the needs of each student. Liulishuo AI is also popular. It is an English learning app powered by AI that employs machine learning (ML) to customize the learning process. It uses cutting-edge deep learning (DL) and adaptive learning technologies.

INDIA

India has a population of 1.43 billion, making it the most populous country in the world as of 2023 [28]. Its PPP in 2023 was USD 10,175.80, which puts it in the lower-middle group for this indicator when compared to other countries featured in this report and roughly 40% lower than the SCO average of USD 18,245.90 [29]. However, in terms of government expenditure on education as a percentage of GDP in 2022, 4.1% puts it only slightly below the average of 4.4% for the SCO countries [30]. The figures from 2020 are consistent with this observation: 15% of all government expenditure is slightly lower than the SCO average of 16.3%, but that still places India firmly in the middle, compared to other SCO countries [31].

Key messages

1. India has successfully developed several state-sponsored multiplatform nationwide systems for online learning in the last few years, such as DIKSHA, SWAYAM and SWAYAM PRABHA, which were presented at the G20 Summit in 2023 [32].
2. An Atal Tinkering Laboratory (ATL) initiative resulted in the emergence of 10,000 innovation labs in secondary schools nationwide to promote a culture of innovation and entrepreneurship by developing the curiosity, imagination and creativity of school-aged children [33].
3. In 2023, India had the highest relative AI skill penetration rate in the world (2.75 times the world average), placing it ahead of the United States of America (2.22 times the world average) and Germany (1.9 times the world average) [34].
4. The National Education Policy (NEP) 2020 was behind the launch of a competency-based education model that initiated a shift towards multimodal teaching and learning. The NEP advocates for the integration of technology into education through gamification, apps, assistive devices, learning platforms and other methods [35].

Government initiatives

DIKSHA

Digital Infrastructure for Knowledge Sharing (DIKSHA) was launched in 2017 as a portal and app with educational content geared towards Grades 1–12. This unique platform features more than 9,500 courses with over 300,000 pieces of content in 29 Indian and 7 other languages and currently seems to be the most multilingual government-sponsored platform in all SCO countries [36]. DIKSHA was presented as one of the major educational achievements of India at the G20 Summit in September 2023 and claimed to have had 31.5 billion hits since 2017 [37]. Other metrics show that 166 million learners enrolled on this platform and accumulated more than 136 million course completions between them; a total of 60.1 billion learning minutes have been spent on the 5.24 billion learning sessions [38]. One of the latest additions to DIKSHA was the AI-based Tara bot, which can answer learners' questions formulated as voice queries [39].

SWAYAM

SWAYAM is a massive open online course (MOOC) platform that was also launched in 2017. Unlike DIKSHA, it is geared towards students in Grades 9 and higher and students in higher education. SWAYAM has more than 3,000 courses that include video-based lectures, reading materials, self-assessment tests, quizzes and forums [40]. It has had more than 30.1 million enrolments, 24 million of which ended with learners either sitting an exam or gaining credits [41].

SWAYAM PRABHA

SWAYAM PRABHA is a group of educational direct-to-home (DTH) television channels. It was launched in 2017 and broadcasts 24 hours a day, 7 days a week [42]. There is a separate channel for every school grade with four hours of new daily content repeated six times a day. Its educational content is also available on its YouTube channels. The languages of instruction on SWAYAB PRABHA are English, Hindi and Urdu. In addition to 59 school channels, there are 50 higher education channels and 10 channels dedicated to SATHEE (Self-Assessment, Test and Help for Entrance Exams) preparation [43]. SATHEE is an initiative by the Ministry of Education to allow students to learn independently and prepare for formal exams – for example, the Joint Entrance Examination (JEE), an entrance examination for engineering colleges in India, and the National Eligibility-cum-Entrance Test (NEET), an entrance examination for prospective medical students [44].

Atal Tinkering Labs

Atal Tinkering Labs (ATL) are new workplaces in schools (typically former classrooms or other suitable areas) that act as innovation and entrepreneurship labs for students from Grades 6 to 12. As of 2023, there were around 10,000 operational ATLs in more than 680 districts, with 7.5 million students involved. Sixty per cent of the labs were in government and rural schools [45]. However, given the massive size of the educational sector in India and the fact that in 2022 there were 38.5 million students in secondary and 28.6 million students in higher secondary schools, the 7.5 million represents only approximately 11.1% of eligible schoolchildren [46].

The labs are funded by the Atal Innovation Mission (AIM), the flagship initiative of the Indian Government to promote a culture of innovation and entrepreneurship. Every school with an ATL is given approximately USD 24,000; half of that is meant to cover the set-up costs and the balance is meant to cover the running costs for five years [47]. The chief objective of ATLs is to promote curiosity, imagination and creativity among students. They are also meant to help students understand science, technology, engineering and mathematics (STEM) concepts. A typical lab contains educational kits and equipment such as electronics, science equipment, robotics, sensors, 3D-printers, computers and microcontroller boards. In addition, teachers and students can use a special ready-made curriculum with more than twenty modules (including one on AI) available online [48].

Private initiatives

India has some of the world's largest commercial EdTech platforms, including BYJUS, Vedantu and Toppr. Byjus, for example, had 670 million visitors in the six months from June through to November 2023 [49]. Toppr had 437.3 million visitors during the same period [50]. Even relatively low performers such as nexteducation.in (almost 189 million visitors) and unacademy.com (almost 100 million visitors) still show impressive results. These numbers were recorded by the Similarweb platform. Figure 3 is a screenshot of a graph showing how visitor numbers changed between June 2023 and November 2023 for five educational platforms.

The Indian EdTech market had a total revenue of USD 4.3 billion in 2022, with the pre-K and K–12 sectors accounting for 44.3% of the market's overall value [51]. In a ranking of the most visited education websites worldwide in July 2024, BYJUS came in at number 4, Toppr at number 12 and Vedantu at number 31 [52].

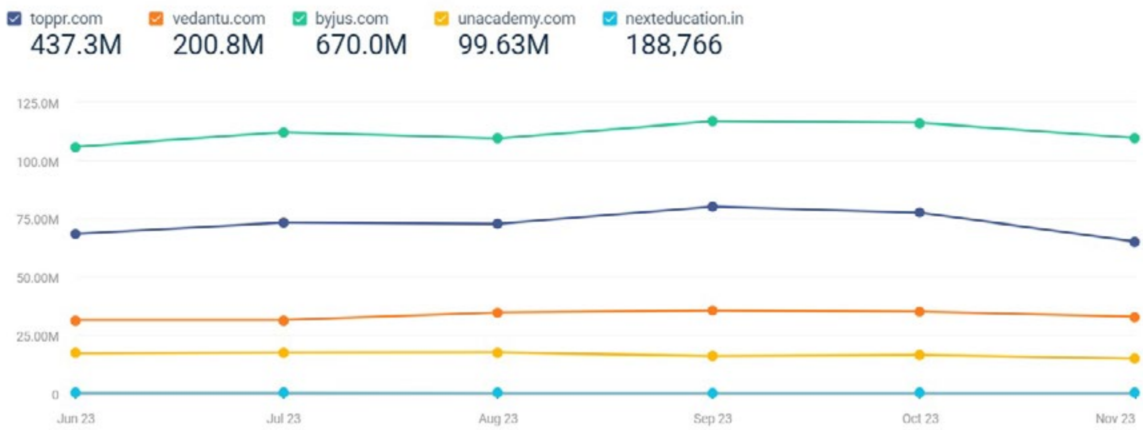


Figure 3. Commercial EdTech platforms in India, 2023

Source: Similarweb.com, November 2023

AI in school education

In 2023, India had the world's highest relative AI skill penetration rate – 2.75 times the world average [53, 54]. It was followed by the United States of America (2.22 times the world average), Germany (1.9 times the world average) and Canada (1.67 times the world average) [55]. In the education industry in 2021, India had an even greater lead: 3.96 times the world average [56].

A white paper on the National Education Policy 2020 published by the Indian Ministry of Education [57] emphasizes the integration of AI into education, but data from Google Trends showed there was quite low interest in AI among the Indian population in 2023 (27 points), compared to interest in the neighbouring countries of China (100 points), Nepal (49 points) and Pakistan (43 points) [58].

Given the diverse multi-ethnic and multilanguage population of India, intelligent tutoring systems (ITS) driven by AI are especially important tools for addressing the needs of every learner. For example, in India, AI is used in ITS to aid teachers in assessment, progress tracking and providing individualized feedback. In a recent report on the state of AI in the Indian educational sector [59], lack of inclusivity (with regards to gender or minorities) and lack of a human dimension were seen as the main challenges to AI literacy in India.

IRAN

As of 2023, Iran had a population of 89.8 million [60] and a PPP of USD 17,921.70, which put it in the mid-range of SCO countries. Although this PPP is lower than that of China (USD 24,557.60), it easily surpasses that of all other SCO countries, except Russia and Kazakhstan [61]. Government expenditure on education in 2022 was 3.1% of GDP [62], which was significantly lower than the average of SCO countries, but figures from 2020 show that the share of educational spending in the national government budget was the highest among all SCO countries at 22.70% [63]. In 2023, Iran ranked 75th in the world out of 166 countries in the overall Frontier Technologies Readiness Index [64], with an ICT rank of 78/166, skills rank of 74/166 and R&D rank of 35/166.

The various provinces in Iran have an ongoing digital divide. School attendance rates are generally high in the country, with enrolment at 99.7% for primary school and 86% for secondary school in 2017 [65]. However, poverty, disability, immigration, distance from school and certain cultural barriers have all been identified as major reasons why out-of-school children are concentrated in certain provinces. The most disadvantaged areas – Kerman, Hormozgan and Sistan and Baluchestan – have the highest percentage of out-of-school children in the country [66].

Key messages

1. While economic statistics are easily available, data on the use of ICT and AI in education in Iran are very difficult to find.
2. The main barriers to access to and availability of technology in Iran seemed to be poverty and the low broadband internet penetration speed [67, 68].
3. In early 2024, internet penetration stood at 81.7% in Iran; approximately 48 million people (53.6% of the population) used social media during the same period [69]. The median mobile internet speed at the start of 2024 was 31.82 Mbps (it decreased by 22.3% in the preceding twelve months) and the median broadband speed was 12.76 Mbps (increased by 10.1% during the same period) [70].
4. Poverty is the main barrier to accessing distance learning. According to figures from 2020, 40%–55% of Iranians live under the poverty line and the majority of internet users (80%) live in urban areas [71].

Government initiatives

In response to the COVID-19 pandemic and subsequent lockdown, the Islamic Republic of Iran Broadcasting (IRIB) channel began broadcasting televised educational programmes in March 2020 [72].

Shad learning app

At the beginning of the pandemic, the Iranian Ministry of Education released an online learning app called Shad for Android [73]. Shad stands for Students Education Network; 'shad' also means 'happy' in Persian. The Ministry of Education claimed that 60% of all students and 94% of all teachers attended 64% of classes through the app in 2020 [74].

Shad's structure mirrors that of a traditional school – students join virtual classrooms, and classes are scheduled by school principals – to ensure continuity in the teaching and learning process. Principals and administrative staff oversee the classroom activities, monitoring teachers' performance and tracking students' attendance.

Figure 4. Online learning in Iran (1)
Source: Iranian Students' News Agency. https://www.isna.ir/news/1401092818669/

However, despite this solid foundation, Shad has received its fair share of criticism [75, 76]. Students who did not have a smartphone/tablet or internet connection – 8 million people in Iran do not have a phone and 23 million do not have a smartphone – could not use the Shad app [77]. Additionally, the app was criticized for experiencing frequent technical errors, having a complicated interface and slow performance and being available only on the Android platform. The scarce statistics available showed that in 2020, it had over 800,000 views daily [78] from among the 6.1 million secondary school attendees that year [79]. In April 2020, unofficial estimates suggested that the average rate of registration throughout the country was 24.6% of all students. The Kurdistan and Sistan and Balouchestan provinces had the lowest access rates to the app; the capital, Tehran, had the highest, at 43.1% [80]. Iranian teachers previously used WhatsApp and Telegram for distance teaching, but after the introduction of Shad, the Ministry of Education banned the use of other apps [81, 82].

Private initiatives and distance learning

Language learners in Iran most often use international platforms such as Duolingo, Babbel, BBC Learning English, iTalki and English Club. Interestingly, 81% of Iranian students stated in 2020 that they use social media for language learning [83].

Figure 5. Online learning in Iran (2)
Source: Mashregh News. https://www.mashreghnews.ir/photo/1141694/

Filimo School

Filimo is an Iranian on-demand video service that has a 'School' platform [84] on which it offers educational courses for students from pre-school to Grade 9. The platform has two key pillars: making learning enjoyable and advancing educational justice. Filimo School provides its services free of charge to students in underprivileged regions such as Zahedan and Sistan and Baluchestan. As of November 2024, students in 405 remote and economically disadvantaged cities across the country have been able to take advantage of the free services. In addition, students in areas that are categorized as 'semi-deprived' can access Filimo School's educational programmes at significantly discounted rates using their national ID and mobile phone number. Students in more affluent regions pay a subscription to access the platform's extensive catalogue of educational materials.

My Dars (My Lesson)

My Lesson is a top-tier educational aid application developed by the Asr Educational Group. It is designed to enhance and elevate the academic performance of students in Grades 4–12 [85]. This app provides clear and thorough explanations, just as a human teacher would, for all textbook questions in addition to specialized educational content and handouts.

With My Lesson, students simply select a topic and textbook to gain instant access to comprehensive, well-structured handouts. Covering all theoretical academic disciplines –including mathematics, experimental sciences and humanities – the app provides expert guidance on both specialized and general topics within these fields and offers key insights and detailed explanations that make complex concepts easier to grasp. Students can choose which subjects they study.

Livebook

The Livebook app is designed to be used by students in Grades 1–12 and teachers. It offers comprehensive curriculum content along with a wide range of exercises and sample questions for each lesson [86]. To access the content, users must first register and specify their academic level. They then have access to an extensive library of educational resources, including instructional videos, podcasts, supplementary materials, booklets, exercises and sample questions. Additionally, they can upload a PDF version of their school textbooks, thus consolidating all their learning materials in a single location.

One of Livebook's standout features is its integration of VR technology. When a student points their phone at a specific page, the system then displays a wealth of relevant content related to the topic, essentially allowing users to personalize their learning experience down to the finest detail. Students can share their material on the platform, creating a wiki-type environment.

KAZAKHSTAN

In 2023, Kazakhstan had a population of 19.9 million [87] and a PPP of USD 39,332.50, which is comfortably higher than that of all other SCO countries, except Russia (USD 44,103.50) [88]. Its government expenditure on education as a percentage of GDP in 2022 – 4.5% – was in the mid-range compared to other SCO countries, with Kyrgyzstan (7.2%), Tajikistan (5.7%) and Uzbekistan (5.2%) spending more. The share of educational spending in the state budget in 2020 was in the higher range at 20.20%, similar to that of Kyrgyzstan (20.8%) and Uzbekistan (21.8%) [89].

Key messages

1. Kazakhstan offers an early introduction to digital skills training. Beginning from Grade 1, students are introduced to topics such as algorithms, cybersafety and cybersecurity. From Grade 3 onwards, the curriculum includes coding, 3D printing and robotics [90].
2. During the 2020/21 academic year, thirty-one new programmes were implemented in leading vocational education and training (VET) colleges to train specialists for the digital industry. ICT programmes in higher education were also updated to meet professional standards [91].

Government initiatives

The 'Digital Kazakhstan' government initiative stipulates that by 2027 all schools should have a high-speed internet connection and that digital literacy should be taught from Grade 1 [92].

Learners have access to a plethora of online resources – for example, BilimLand, Daryn Online, Opiq Platform, iTest.kz, 100ballov.kz, NIS Play and iMektep. In April 2024, according to government sources, 100% of school textbooks were digitized [93]. As of July 2023, more than 7,000 schools – approximately 90% of all schools in Kazakhstan – use online platforms for various aspects of attendance record-keeping, student diaries, assessments, homework, lesson planning and remote learning [94]. Figures 6 and 7 show students at the annual RoboLand robotics competition.


Figures 6 & 7. International ROBOLAND 2023 robotics contest in Karaganda, Kazakhstan
Source: https://edurobots.org/2023/11/roboland-2023/

Non-government initiatives

BilimLand

BilimLand is an online portal with educational content in three languages, 45,000 interactive lessons, 75,000 secondary state school exam questions, virtual labs and simulations [95]. It is estimated that more than 7,000 schools and more than 2.5 million students use this platform [96].

Daryn Online

Daryn Online is an educational platform that contains 25,000 interactive video lessons, covering the forty-two subjects within the national curriculum in both Kazakh and Russian [97]. It contains 500,000 learning and assessment tasks, and an estimated 3,000 schools, 3.6 million students and 350,000 teachers used it in 2022 [98].

KYRGYZSTAN

In 2023, Kyrgyzstan had the smallest population of all the SCO countries at 7.1 million [99]. At USD 7,102.80, its PPP was the third-lowest among this group of countries [100], but its government expenditure on education as a percentage of GDP in 2022 was the highest, at 7.2% [101], and the share of educational spending in the state budget in 2020 – 20.8% – was the third-highest [102].

Key messages

1. Several government initiatives have been launched in Kyrgyzstan: online admission systems for schools and universities, online libraries and school management information systems (MIS), the Sanarip Sabak online learning portal and an online learning portal for primary schools.
2. More than offline 100 programming courses and approximately 20 robotics courses are available, almost all of them in Bishkek and Osh, the two largest cities in Kyrgyzstan [103].
3. The perception of Kyrgyzstan as a democratic country means it attracts attention from Western NGOs, such as the Soros Foundation, and other donors, that support technology-related initiatives in education.

Government initiatives

The Kyrgyzstan Government is behind a number of initiatives, whose main characteristics are summarized here.

KITEP is an online library that holds digital textbooks prescribed by the national curriculum for Grades 1–11 in three languages and has more than 30,000 monthly visitors [104]. Open.Edu is a school information system that contains the personal data of 1.7 million students and more than 160,000 staff members of all schools, both state-funded and private, in the country [105]. The site has around 50,000 monthly visitors, according to Similarweb [106].

iBilim is an online learning portal for Grades 1–4. Google Trends identifies it as the most popular online learning resource in Kyrgyzstan. The Sanarip Sabak platform features more than 7,000 video lessons for students in Grades 1–11 [107]. Those video lessons were filmed during the COVID-19 lockdown.

At the time of writing, the videos had accumulated a combined total of 12.1 million views on YouTube [108].

Abiturient-Online is an online admissions system that was introduced in 2020 for enrolling school graduates in universities and TVET institutions. A similar system was launched for admission into schools and pre-schools. The 'Digital School' project was piloted in 2022 in 1,000 Kyrgyz schools – which is approximately 45% of all schools in the country [109].

Non-governmental initiatives

Technology-related educational businesses in Kyrgyzstan – for example, Codify (more than 2,500 students) [110] and Geeks (more than 2,000 students) [111] – primarily offer courses on programming skills and robotics. In 2021, volunteers translated the entire Khan Academy content into Kyrgyz, making it easier for students around the country to access content in their native language [112]. The UNICEF-funded Bilimduu Muun platform (a Kyrgyz version of Learning Passport) was also launched in 2021 to offer educational content for kindergarten students [113].

Soros Foundation initiatives

Until recently, the Soros Foundation was heavily invested in developing education in Kyrgyzstan [114, 115]. Some of their main educational projects are summarized below.

Okuma.kg is an online library with e-books for various school subjects and higher education courses in Kyrgyz. Bilimkeni Academy is a suite of 703 video lessons covering 12 school subjects, made available on YouTube [116]. The '50,000 Programmers by 2030 in KG' project offers eleven free programming courses to prospective software developers [117]. A separate initiative was the preparation of more than 2,600 lessons to be broadcast on television in 2020 as a response to the COVID-19 pandemic and the subsequent lockdown [118].

PAKISTAN

In 2023, Pakistan had a population of 240.5 million, approximately one-sixth of the population of neighbouring India [119]. The country's PPP that same year was approximately 64% lower than that of India, at USD 6,212 [120]. Government expenditure on education in 2022 was 2.0% of GDP [121]. The percentage of this expenditure compared to all government spending in 2020 was 10.8%, which is higher than that of China (10.5%) but lower than that of India (15.0%) [122]. The overall status of ICT and AI in education is also very different in Pakistan than it is in China and India.

Key messages

1. Given that Pakistan has the world's second-highest number of out-of-school children – approximately 22.8 million children aged 5–16 (44% of this age group) are not attending school [123] – the role of EdTech is particularly important.
2. State EdTech initiatives are limited. This has led to the emergence of various commercial and NGO initiatives – for example, SABAQ, TaleemAbad, TaleemGhar and TeleTaleem.
3. The government launched the first mobile learning app for school-aged children in March 2023. As of June 2024, it had amassed only 100,000 downloads and approximately 43,000 users [124].
4. Pakistan has the second-highest household expenditure on education in South Asia at 57%. The cost of internet access is an important factor for families [125].

Government initiatives

TeleSchool Pakistan Mobile App

The TeleSchool Pakistan Mobile app was launched quite recently, in March 2023, as part of the Indian Government's 'TeleSchool Pakistan App, Google for Education and Digital Continuous Professional Development' initiative. It caters to students in Grades 1–12 and offers content in English for nine subjects: mathematics, English, Urdu, science, biology, physics, chemistry, general knowledge and Pakistani studies. The content is mainly in video format – in both broadcast (live channels) and on-demand format – with more than

2,230 videos on offer [126]. There are six live channels, with four channels catering to the needs of school-going children and two channels focused on out-of-school children. Despite the large population of children in Pakistan, as of October 2024, the app registered only 50,000+ downloads on Google Play, approximately 43,000 users and 50,000 views [127]. There could be many reasons for this, but one possible explanation, according to sources in the Pakistani expert community, is that even a modest forty-minute daily use of the app generates approximately 11 Gb of internet traffic per month [128]. For some families, this could be a major barrier because, in the absence of a broadband connection, they must rely on mobile internet options, and those are expensive. Another government initiative, the 100,000 laptops promised by the Prime Minister for high-achieving school students and matriculation exam high performers [129], is a welcome gesture, although it may be less beneficial to students whose families cannot provide them with a broadband connection or mobile internet.

TeleSchool television channel

This television channel was launched at the start of the COVID-19 pandemic for K–12 students. It broadcast daily from 08.00 to 18.00 and delivered content for all grades, with each grade receiving 30–60 minutes' worth of content [130]. The subjects covered were Urdu, English, mathematics, general knowledge, general science, chemistry, biology, physics and computer science. A two-way SMS service was used to communicate the schedule to parents (caregivers). A survey of 1,200 Pakistani households with children conducted in 2020 by Gallup showed that 77% of the survey participants were satisfied with the educational content of TeleSchool and 66% were happy to recommend it to other parents (caregivers) [131].

Private initiatives

SABAQ

SABAQ is an EdTech organization that created the largest e-learning platform in Pakistan [132]. It has approximately 5 million users and is aimed at students from kindergarten to Grade 14. It covers all educational boards in Pakistan (Sindh, Punjab, KPK, Baluchistan and federal) plus the Cambridge/Oxford curriculum and offers eleven subjects: physics, chemistry, biology, mathematics, English, general science, computer science, general mathematics, statistics, accounting and dedicated content for kindergartens. The app has a mobile version for Android and a browser version.

Figure 8. Students in Pakistan learn with a SABAQ device
Source: SABAQ. https://sabaq.edu.pk/

SABAQ states that they have transformed 1,818 schools and established 540 education centres [133]. To facilitate the expansion of the programme, a fully offline-version of SABAQ, called SABAQ Lite, is offered to schools. It uses a Raspberry Pi computer with 128Gb memory, Wi-Fi and UPS (uninterrupted power supply), with all content uploaded in advance.

Other non-government initiatives

Several other initiatives in the Pakistani EdTech sector merit discussion. The TaleemAbad app, for example, is focused on digital content with VR, augmented virtual reality (AVR) and animations for in-school teaching and individual learning for primary and middle grades. It attracts approximately 8.5 million views every week [134]. Another platform is Learn Smart Classroom, an in-school blended learning solution for K–12 students, offered by Knowledge Platform [135]. Aahung Pakistan offers life-skills training through augmented reality (AR), videos and audio on their platform [136], and WonderTree is a technology-driven educational solution for children with SEN and disabilities that has positively impacted more than 20,000 lives [137].

TeleTaleem offers a suite of technology-powered educational solutions for rural and distant schools. The creative on-demand approach of this organization involves a specially designed van with on-board satellite internet visiting rural schools for a short period – for example, a day – to temporarily provide teachers and students with tablets and an internet connection so that they can conduct tablet- and internet-powered lessons, albeit only while the van is at the school. On their website, TeleTaleem claims to have reached 4,000+ schools, 6,000+ teachers and more than 1 million children [138].

Punjab and Sindh provinces

It is important to note that Pakistan consists of five main provinces, two of which are home to more than 75% of the country's population – Punjab (approximately 53%) and Sindh (approximately 23%) [139]. Given their population size, these provinces have their own initiatives in the EdTech sector in addition to those available throughout Pakistan.

For example, during the pandemic, Punjab Province launched TaleemGhar TV, which offered content for Grades 1–10 daily from 09.00 to 15.00, with 30–60 minutes of broadcasting time for each grade, and was available both on-air and online on the Vimeo website. Punjab also has its own school information system, the Taleem Ghar App [140]. And last but not least, there is the E-Learn Punjab platform, an official repository of 30 mathematics and science digital textbooks, complete with 13,047 video lectures, 1,830 animations, 592 simulations and interactive assessments, available as both a web-based and an Android app [141]. E-Learn Punjab has been rolled out to 747 schools, helping more than 52,000 students and 2,000 teachers [142].

Sindh Province partnered with SABAQ/MUSE during the COVID-19 pandemic. Another platform available in this province is the Sindh Online School (SOS), which offers video lessons for students in Grades 1–10 in both English and Urdu [143].

RUSSIA

In 2023, Russia had a population of 143.8 million [144]. It also had the highest PPP – USD 44,130.50 – of all SCO countries. To put this in perspective, the PPP of Kazakhstan, which is the second-highest among the SCO countries, is USD 39,332.50 [145]. Russian government expenditure on education as a percentage of GDP is in the mid-range, at 4.1% [146]. However, the share of government spending on education is the lowest of all SCO countries at only 8.9% [147].

Key messages

1. The Russian Government has implemented several initiatives to integrate technology into school education. Although there are only a few of them, these initiatives reach almost all schools in Russia. For example, 95% of schools were connected to the My School online platform in its first few months [148].
2. According to Brand Analytics, there were over 1,000 online educational platforms in Russia in 2023, the vast majority of which were private [149]. The biggest players are Uchi.ru, Yandex.Uchebnik, Skyeng and Foxford.
3. AI is emerging as a tool that is actively used in Russian education for evaluating students' essays, marking homework or writing lesson plans. It is noteworthy that Yandex has launched its own AI chatbot, called YandexGPT, and its own version of Siri, called Alisa [150].
4. A significant number of VR and AR education solutions have been developed in Russia. They are mainly used to teach science, history and languages.

Government initiatives

The Russian Government has a dedicated federal programme called 'Digital Educational Environment' [151]. Under this programme, IT infrastructure – including more than 149,000 Wi-Fi access points and over 31,000 webcams – was installed in more than 9,000 schools [152]. A particularly interesting development was the launch of 198 'IT-Cube' centres for the digital education of school-aged children and 85 'Quantoriums' (children's technology parks – see Figure 9) [153]. Approximately 37% of all schools were provided with equipment to help them establish a digital educational environment. The programme's annual budget for 2023 was approximately USD 1 billion, which translates into approximately USD 50.00 per student [154].

Figure 9. Quantorium in Tomsk, Russia
Source: https://kvantoriumtomsk.ru/

My School online learning platform

The My School platform was launched in 2023 and at the time of writing approximately 95% of all schools were connected to it, with approximately 6.4 million visitors every month [155, 156]. The platform includes an online school register (mainly to take attendance), a suite of interactive lessons, a content library (videos, e-books, simulators) and a dedicated messaging app (Sferum). This platform is only accessible to users through their official account on the e-government online system, called Gosuslugi.

Private initiatives

As stated earlier, there are more than 1,000 online educational platforms in Russia and the biggest players are Uchi.ru, Yandex.Uchebnik, Skyeng and Foxford [157]. Approximately 17%–22% of schoolchildren use e-learning or online learning; in the vocational education sector, the number is much higher: 38%–45% [158]. In total, in 2019, approximately 100,000 children were enrolled in more than fifty online schools [159], or 0.006% of all schoolchildren for the 2019/20 academic year [160]. In 2020, up to 20% [161] (or approximately 3.4 million schoolchildren in the 2020/21 academic year [162]) were learning with the help of internet technologies. In 2023, most of the online learners came from the Moscow (38.7%) and St. Petersburg (20.5%) regions, the two largest city agglomerations in Russia [163]. However, a large proportion of high-performing traditional schools are also located in these cities, so it raises the question as to whether there might be other reasons for online learning's popularity in Moscow and St. Petersburg.

Uchi.ru

Uchi.ru, established in 2012, is the largest Russian online learning platform for school students in Grades 1–11. In addition to hosting content for school subjects, it includes extracurricular courses, continuing professional development (CPD) content for teachers and courses to help students prepare for state exams. It also offers diagnostic tools for reading literacy and soft skills and is used to conduct online academic competitions, called Olympiads. In 2021 alone, 6 million students participated in these competitions [164]. The platform makes significant use of gamification with over 150,000 game-based tasks [165].

Uchi.ru claims to have an audience of 12 million students, 6 million parents (caregivers) and 800,000 teachers [166]. At the start of the pandemic, in April 2020, it was the second-most visited educational website in the world, according to Similarweb [167].

AI in education

AI in education in Russia is used for evaluating students' essays, teaching mathematics and assessing comprehension, among other tasks. However, teachers in Russia mainly use it to automate tedious tasks such as marking homework and writing lesson plans. Some institutions, such as the Moscow Electronic School, a pioneer in online education in Russia, put it to more sophisticated use. The Moscow Electronic School uses AI to develop personal learning plans for students. An unusual application of AI in education was its use to detect more than 500 violations in 84 regions during the compulsory secondary school graduation exam in 2023 [168].

As of November 2024, access to some major well-known AI tools – for example, ChatGPT, Google's Gemini chatbot and the Microsoft Copilot chatbot – was restricted in Russia by the tools' owners. However, Russian learners can use the YandexGPT AI chatbot, developed by Russian technology giant Yandex. According to experts in the Russian IT community, YandexGPT consistently surpasses ChatGPT-3.5 and sometimes outperforms ChatGPT-4, but overall, it still lags behind these tools. Yandex has also developed a virtual assistant called Alisa, a Russian version of Siri, Alexa and Google Assistant [169].

TAJIKISTAN

In 2023, Tajikistan had a population of 10.1 million [170] and a PPP of USD 5,082.20, which is the lowest of all the SCO countries [171]. However, in terms of government expenditure on education, Tajikistan is a top performer: educational spending as the share of GDP was 5.8% in 2023 [172], the second-highest of the SCO countries, and educational spending as the share of all government spending was 21.4% in 2022 [173].

Key messages

1. Less than 20% of schools in Tajikistan have internet access [174]. In 2020, the country had only twenty-three mobile internet cellular subscriptions and 0.1 broadband subscriptions per 100 people [175]. This is why there was no formal shift to distance education during the COVID-19 pandemic in Tajikistan [176], and only some private schools and individual teachers practised some forms of distance education, mainly in Dushanbe, the capital of the country [177].
2. Tajikistan actively works with international organizations such as UNICEF, UNESCO, the European Union (EU) and the Asian Development Bank to develop and implement technology-related educational initiatives.
3. Teachers and learners in Tajikistan make active use of Russian online educational platforms, such as Yandex.Class, GeekBrains, Skillbox and the Moscow Electronic School.

Government initiatives

The 'Shift to Digital Education 2023–2042' government programme was launched in 2022 [178]. It is designed to train teachers in digital learning practices, foster the development of digital and online education and launch digital education initiatives. It is also responsible for providing the required computer equipment and internet connectivity to all schools; developing e-content for all subjects in Tajik; and implementing interactive learning practices [179].

With regards to online learning, the latest nationwide online learning development was in January 2022 when all schools moved to the online format for a month [180]. Lessons were broadcast on national TV and recordings were available on a Telegram channel called 'Online School'. No other means of online learning were offered on a national level [181].

Partnership between government and UNICEF

Since 2020, UNICEF has contributed approximately USD 7.6 million to help fund teacher training, launch three digital platforms, purchase tablets and map real-time connectivity of all 3,940 schools in Tajikistan. Approximately 2.2 million learners have benefited from this funding as well as funding from the EU, IsDB and Global Partnership in Education [182].

Tomaktabi.tj (Magic Box)

Tomaktabi.tj is a digital platform for pre-primary education launched in partnership with UNICEF in 2022 (see Figures 10 and 11). It is essentially a Tajik version of Learning Passport, the programme developed for 5.4 million children in Europe and Central Asia, 1.5 million of whom are in Tajikistan [183].

Figure 10. Tomaktabi.tj (Learning Passport) launch
Sou rce: UNICEF. https://www.unicef.org/tajikistan/press-releases/tomaktabitj-introducing-digital-platform-early-child-education-benefit-over-million

The platform features seven curricula, eighty-two activities, nine teacher guides and six CPD resources for educators [184]. In 2022, Tomaktabi.tj was on target to reach 890,000 children aged 3–6 within one year [185]. There are no updates to confirm if it achieved its target.

Figure 11. UNICEF and Ministry of Education, Tajikistan, collaborated on the Tomaktabi.tj project

Sou rce: UNICEF. https://www.unicef.org/tajikistan/press-releases/tomaktabitj-introducing-digital-platform-early-child-education-benefit-over-million

Maktab Mobile

Maktab Mobile is the first e-learning portal of the Ministry of Education and Science for primary and secondary school students. It includes lessons with videos, animations, photographs and audio recordings; practice exercises; instructional videos; and a personalized learning dashboard. It also has attendance and class management tools for teachers. The platform offers both offline and online access and was made available to 2.2 million students in 2022 [186].

Teacher Learning and Innovation Centre

The Teacher Learning and Innovation Centre opened in 2022 in Dushanbe, the capital of Tajikistan. Its aim is to develop video lessons in accordance with the national curriculum and to promote innovative blended learning content. The centre opened in partnership with the EU and UNICEF and was funded by the EU initiative 'Quality Education Support Programme II' [187].

Omuzgor Mobile

Omuzgor Mobile is a teacher training platform that aims to teach digital learning practices to 10,000 teachers – that is, approximately 8% of all primary and secondary teachers in Tajikistan [188].

Other initiatives

USD 40 million grant from the Asian Development Bank

In December 2023, the Asian Development Bank (ADB) approved a USD 40 million grant to improve STEM teaching in Tajikistan [189] by overhauling teaching strategies for Grades 5–11, a shift that involved moving from a skills-based approach to one that supported the development of critical analysis and collaboration skills for real-world problem-solving. The initiative includes training for teachers, a review of learning materials and the upgrading of facilities in twenty schools. It is anticipated that the project will directly impact more than 11,500 students in those twenty schools and approximately 4,000 current and aspiring STEM teachers and school leaders [190].

Open JS School

Open JS School was launched in May 2020, making it the first online learning platform in Tajikistan. Its purpose is to teach programming skills in JavaScript. Because of problems with connectivity and internet speed in Tajikistan, the platform focuses on providing instructional PDFs instead of videos to minimize traffic [191].

UZBEKISTAN

In 2023, Uzbekistan had a population of 36.4 million [192] and a PPP of USD 9,724.70, which put it, like India (USD 10,175.80), in the mid-lower range of SCO countries [193]. In terms of government expenditure on education as a share of GDP, in 2022, Uzbekistan had the third-highest figure among SCO countries – 5.2%, surpassed only by Kyrgyzstan (7.2%) and Tajikistan (5.7%) [194]. The share of educational spending in the state budget is the second-highest among all SCO countries at 21.8% [195].

Key messages

1. Most of the initiatives connected with the use of technology in education in Uzbekistan are government initiatives. Emaktab, Online Maktab, ZiyoNET and Maktab.uz are the most popular ones.
2. Until recently there were no online schools in Uzbekistan. Currently, only two players are offering online education within the framework of the national curriculum: Maktab.uz, which is state-funded, and Leader Online, which is the first Uzbek online private school.
3. The government stated in 2022 that 99% of schools had high-speed internet [196], but a slow connection is still the main obstacle to using online educational resources. In 2023, Uzbekistan was ranked 112th in the world in the Speedtest Global Index for its average mobile internet speed (20.33 Mbps) and 87th for its average broadband speed (51.61 Mbps) [197].

Government initiatives

eMaktab

eMaktab, previously known as Kundalik, is the most popular online learning platform in Uzbekistan. It had 16.4 million monthly visitors in October 2024 [198] and is available as a mobile app for Android and iOS. It includes an online school register (mainly for taking attendance) and the Kundalik.Smart portal, which offers content for all school subjects and caters for Grades 1–11. Kundalik.Smart comprises ready-made lessons, a lesson design tool, an assessment tool, interactive simulations and gamification tools. eMaktab was launched in 2020 and was originally used by approximately 2,500 schools;

that number now stands at more than 5,000 [199], which is approximately half of all schools in Uzbekistan. The content is available in both Uzbek and Russian. Figure 12 shows eMaktab's home page.

Figure 12. eMaktab: Home page

Online Maktab TV

Online Maktab TV was launched in the early days of the COVID-19 pandemic in 2020 as a suite of ten educational TV channels that broadcast new content daily (and repeated it throughout the day) for students in Grades 1–11 alongside its own dedicated YouTube channel. The videos were structured as lessons for all school subjects and were delivered in Uzbek. The only exceptions were Russian and English language lessons, which were conducted in their respective languages. While Online Maktab stopped broadcasting some time ago, it is still adding videos to its YouTube channel. At time of writing, the last video was uploaded in April 2023 and 502 videos were available [200]. It is difficult to say how often the videos are used by learners at the moment.

ZiyoNet

While not the most popular option with learners – it attracts approximately 84,000 visitors per month [201] – the ZiyoNET educational portal was one of the first state initiatives in Uzbekistan. It offers content in English, Russian and Uzbek and features more than 113,500 educational resources and 8,274 audio resources. A unique feature of ZiyoNET is that it offers users the opportunity to create and host their own website. It claims to have over 5,455 user-generated websites, as of November 2024 [202].

Online schools

Maktab.uz

Maktab.uz is a state-funded online platform that welcomed approximately 425,000 monthly visitors in 2023. Its content covers the entire school curriculum and is designed for students in Grades 1–11 [203]. Maktab.uz includes a library of video tutorials and other educational content in English, Karakalpak, Russian and Uzbek. Overall, more than 7,700 videos and 2,500 presentations are available on the platform [204]. In addition to school subjects, Maktab.uz offers resources for extracurricular courses such as programming, graphic design, robotics, effective communication and leadership.

Leader Online School

Leader Online, launched in 2022, is the first – and currently the only – online private school in Uzbekistan that teaches the national curriculum to Grades 1–11. It offers 100 online courses with around 3,000 tests and assignments. The languages of instruction are Russian and Uzbek. As of summer 2023, more than 1,500 students had completed online courses at this school [205].

Bring Your Own Device policies across the SCO countries

The bring your own device (BYOD) approach is frequently seen as a way to improve learning through technology. However, there is a growing trend among SCO countries to prohibit the use of personal devices in schools, albeit to varying degrees. At time of writing, India and Pakistan do not have a strict nationwide ban, and policy differs from one local educational authority to another – for example, New Delhi has a city-wide ban [206]. In China, Iran, Kazakhstan, Russia, Tajikistan and Uzbekistan, the use of personal smartphones by students in schools is prohibited nationwide, although Kazakhstan and Russia did not implement a ban until 2024. The policies of some regions include a clause that smartphones can be used by students for emergency purposes (Uzbekistan) [207], if their parents (caregivers) have provided permission in the form of a written note (China) [208] or during lesson breaks (Russia) [209]. Among the SCO countries, at time of writing only Kyrgyzstan allowed the use of personal smartphones in schools (with some restrictions), but as recently as March 2024 there were government-level talks about introducing a ban. Overall, the SCO countries are following a global trend towards banning the personal use of smartphones in school. It could be argued that some were helping to set the trend by introducing the ban years before the July 2023 UNESCO Global Education Monitoring Report that called for the ban on the use of mobile phones in schools [210].

QUANTITATIVE INDICATORS

Notes

For most of the data in this chapter, unless otherwise specified, the period analyzed is the 2021/22 academic year. We chose this period because more recent data for certain criteria were unavailable for some countries. Data from other periods are used for ease of reference, where appropriate. For internet penetration rates, mobile connections, number of internet users, median internet speed and other data, we used reports from DataReportal [211].

Households with a computer

This indicator shows the proportion of households that have a computer, defined as 'a desktop computer, a portable computer (a laptop) or a handheld computer (a tablet)' [212] (see Chart 1).

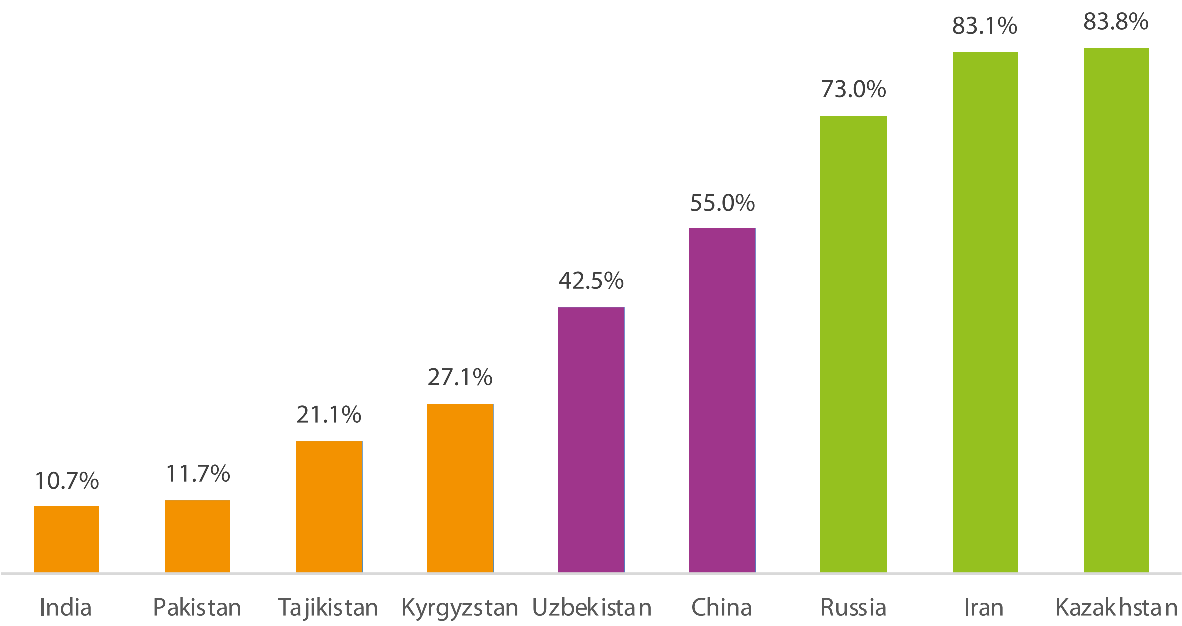


Chart 1. Proportion of households with a computer

Source of data: ITU. Households with a computer. DataHub. https://datahub.itu.int/data/?i=12046

The top performer in this category is Kazakhstan (83.8%). Iran (83.1%) follows very closely behind, and Russia comes in third, with almost three-quarters (73%) of households owning a computer. The mid-range performers are China, where just over half of households (55%) own a computer, and Uzbekistan (42.5%). The low performers are in two tiers – Tajikistan and Kyrgyzstan (20%–30%), and India and Pakistan, which demonstrate the lowest performance in this category (10.7% and 11.7%, respectively).

Internet penetration rates

This indicator shows the overall internet penetration rate in SCO countries in 2023 (see Chart 2) [213]. The internet penetration rate is defined as the percentage of the total population that uses the internet. The term 'uses the internet' implies that a person has both access to the internet (a device and an internet connection) and at least a basic ability to use it [214].

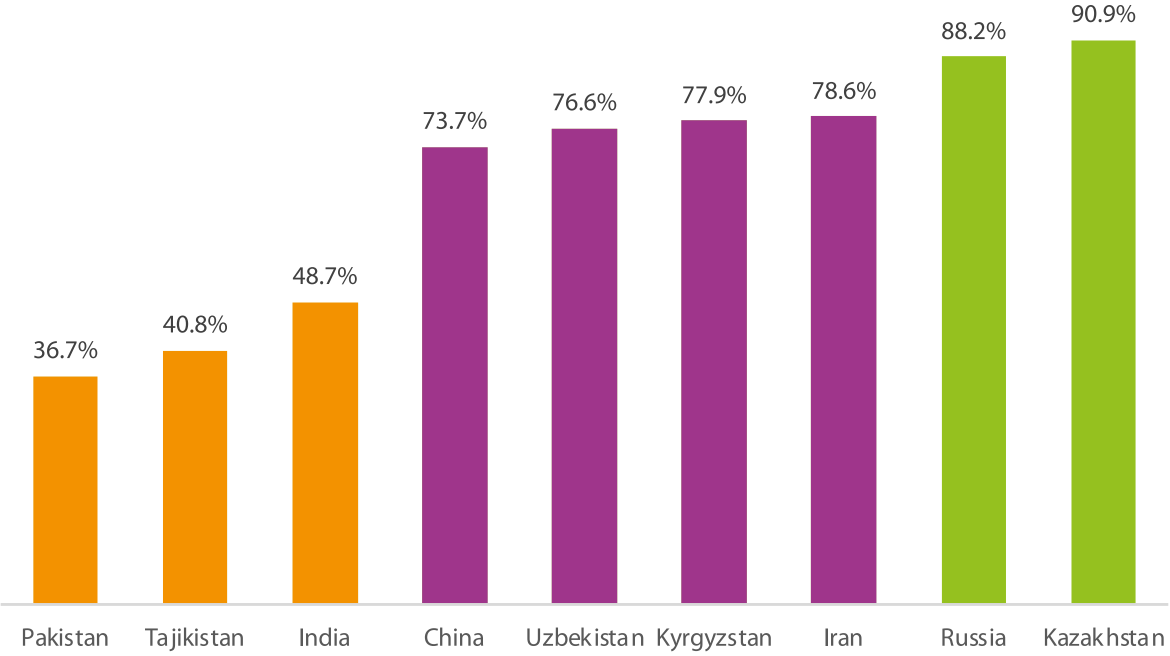


Chart 2. Internet penetration rate
Source of data: Kemp, S. 2023, 27 April. Digital 2023 April global statshot report. DataReportal. https://datareportal.com/reports/digital-2023-april-global-statshot

The top performers in this category are Kazakhstan (90.9%) and Russia (88.2%). Relatively close behind them are Iran, Kyrgyzstan, Uzbekistan and China (73%–79%), followed by India (48.7%), Tajikistan (40.8%) and Pakistan (36.7%), with noticeably lower rates.

Given the vast population – 1.43 billion [215] – and low internet penetration rate of India, it could be said that the country has the world's largest unconnected population – approximately 735 million people. The unconnected population of China, which is a similar size, is only 375 million. Pakistan has the smallest internet penetration rate – approximately 150 million people, or almost two-thirds of the population [216].

It is interesting that both top performers, Russia and Kazakhstan, are very large in terms of area – number 1 and number 9 in the world, respectively [217]. It would be reasonable to assume that it is more difficult to provide broadband or mobile internet across a large expanse of land from a technological point of view, especially as satellite internet access remains a relatively expensive, and thus exclusive, technology. However, both Russia and Kazakhstan have a very low population density – 9 people/km^2 and 8 people/km^2 respectively – compared to low performers such as India (492 per km^2), Tajikistan (78 per km^2) and Pakistan (331 per km^2) [218]. This suggests that there may be other factors at play, such as, for example, GDP per capita (which is highest for both Russia and Kazakhstan among all SCO countries) [219].

Cellular mobile connections

This indicator shows the number of cellular mobile connections as a percentage of the total population of a country [220] (see Chart 3). The available data show that students, both in schools and in vocational education, overwhelmingly use their smartphones to access educational content online; the number of tablets, laptops and stationary computers is low compared to the number of smartphones, especially in developing countries. The State of Mobile Internet Connectivity 2023 Report [221] states that although 57% of the world population was using mobile internet by the end of 2022, the biggest gap in connectivity arose from having no device at all (26%) rather than having a device but no internet connectivity (8%).

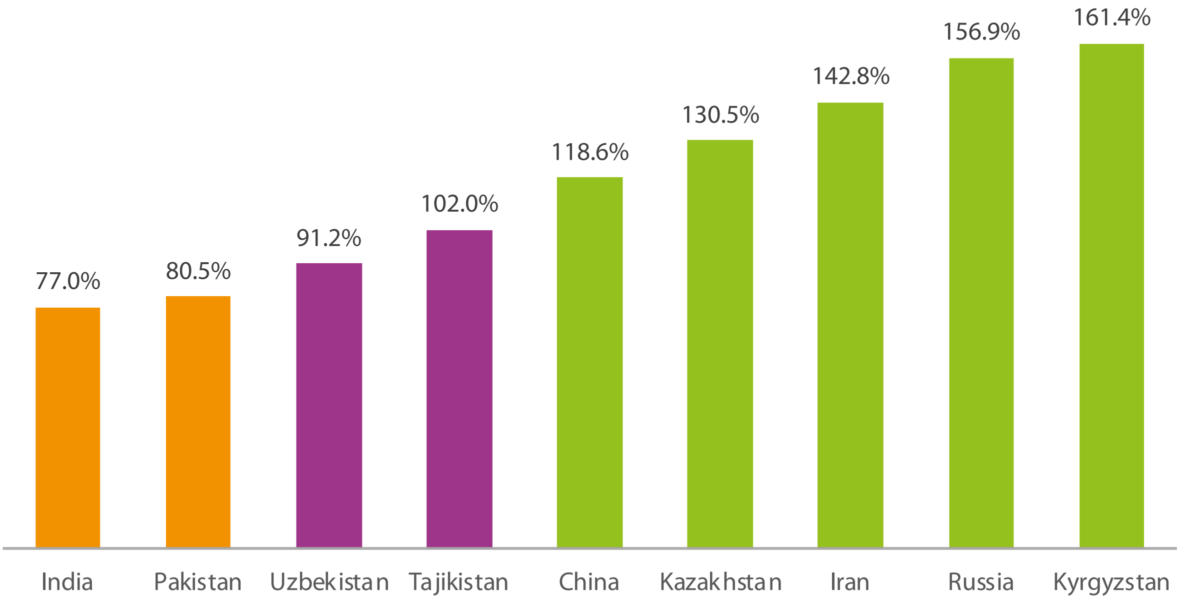


Chart 3. Cellular mobile connections

Source of data: Kemp, S. 2023, 27 April. Digital 2023 April global statshot report DataReportal. https://datareportal.com/reports/digital-2023-april-global-statshot

The figures in the chart above can exceed 100% because a person can have several cellular mobile connections: more than one phone, a dual-SIM phone, connected devices (tablets, smart watches, trackers, wireless cameras, etc.) or extra SIM cards that can be swapped as needed. A person who uses one or more cellular mobile connections is called a unique mobile subscriber. In 2022, there were 5.4 billion unique mobile subscribers, which constituted approximately 68% of the world population, according to The Mobile Economy 2023 report [222].

The top performers in this category, all of which have rates of significantly more than 100% of the population, are Kyrgyzstan, an absolute leader with 161.1%, followed closely by Russia (156.9%), Iran (142.8%), Kazakhstan (130.5%) and China (118.6%). Uzbekistan and Tajikistan occupy the middle ground (91%–102%), while Pakistan (80.5%) and India (77.0%) have similarly low rates.

It was interesting to analyze the variations between the internet penetration rate and the percentage of mobile cellular connections (see Chart 4). The biggest difference was observed in Tajikistan, where the percentage of mobile connections was almost 2.5 times the internet penetration rate. In Pakistan it was 2.2 times, and in Kyrgyzstan it was 2.1 times. This could be indicative of a wider digital divide, a higher inequality level or, in the absence of other explanations, a national culture of having multiple SIM cards. The lowest differences were observed in Uzbekistan (1.2 times) and Kazakhstan (1.4 times), which are ranked highest among the SCO countries in the World Happiness Report 2024 [223].

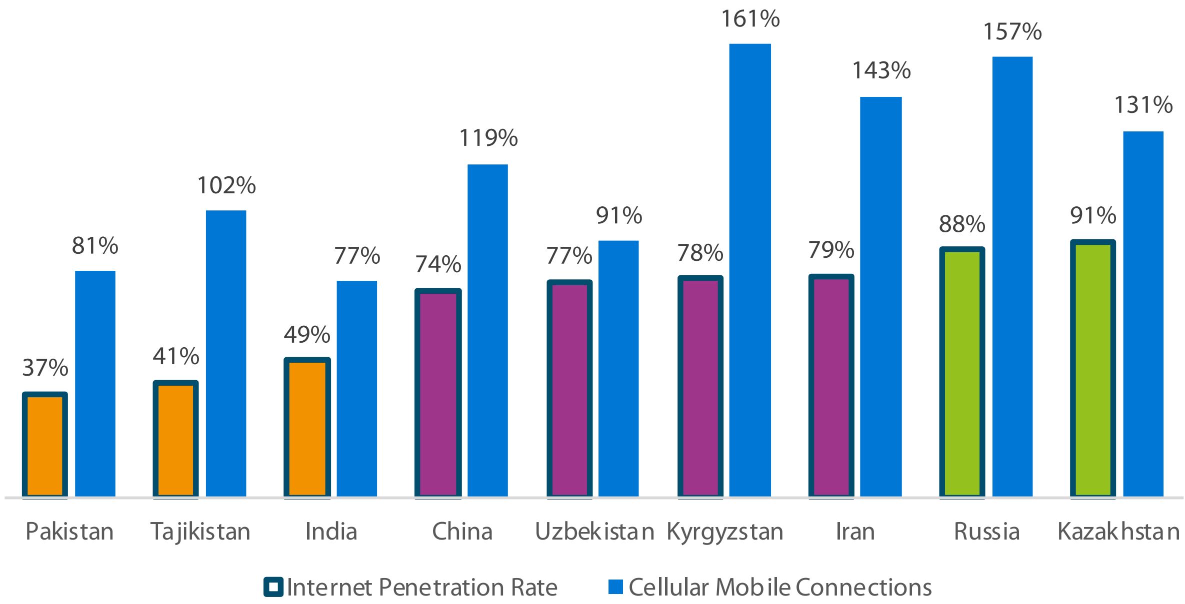


Chart 4. Internet penetration rate vs cellular mobile connections

Source of data: Kemp, S. 2023, 27 April. Digital 2023 April global statshot report. DataReportal. https://datareportal.com/reports/digital-2023-april-global-statshot

This indicator shows the median internet connection speed in each country, for both the fixed connection internet and the mobile connection internet, in megabits per second (Mbps) [224] (see Chart 5).

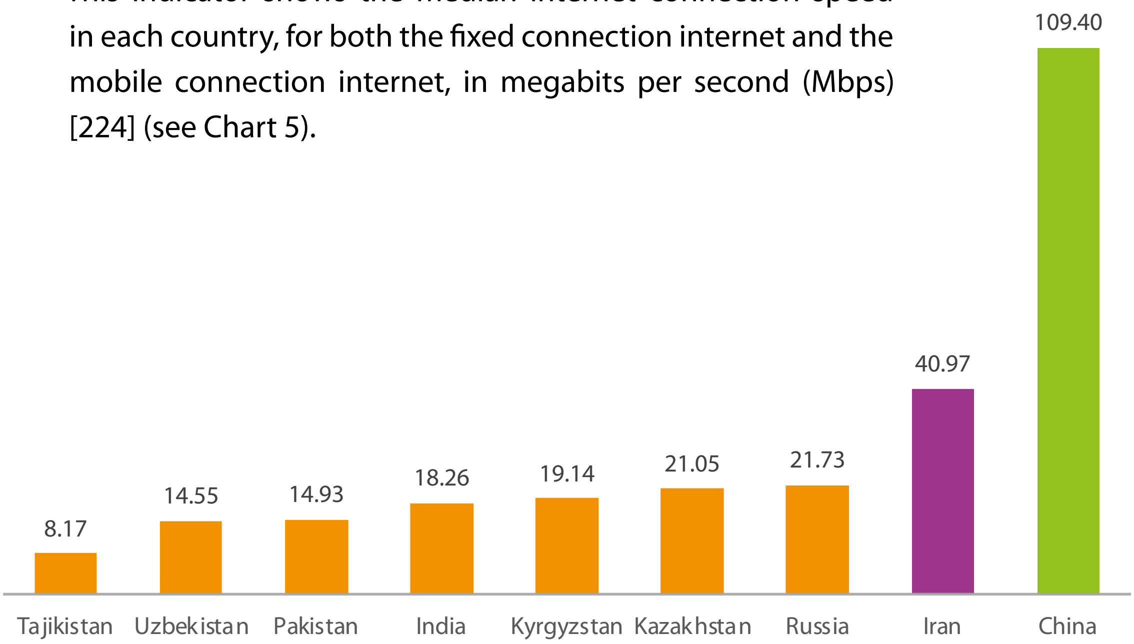


Chart 5. Median mobile internet connection speed, Mbps, 2023

Source of data: Kemp, S. 2023, 27 April. Digital 2023 April global statshot report. DataReportal. https://datareportal.com/reports/digital-2023-april-global-statshot

Median internet speeds

The most obvious takeaway from this chart is that the median speed of mobile internet in China outstrips that of all other SCO countries, at 109.4 Mbps. The second-fastest median speed is found in Iran, at 40.97 Mbps. While this is only approximately one-third of the median speed in China, it is at least double the median speed of the other countries. Our calculations show that the median mobile speed in Tajikistan of 8.17 Mbps means that a 1 Gb file would be downloaded in 16 minutes, whereas in China it would take only 1 minute 13 seconds.

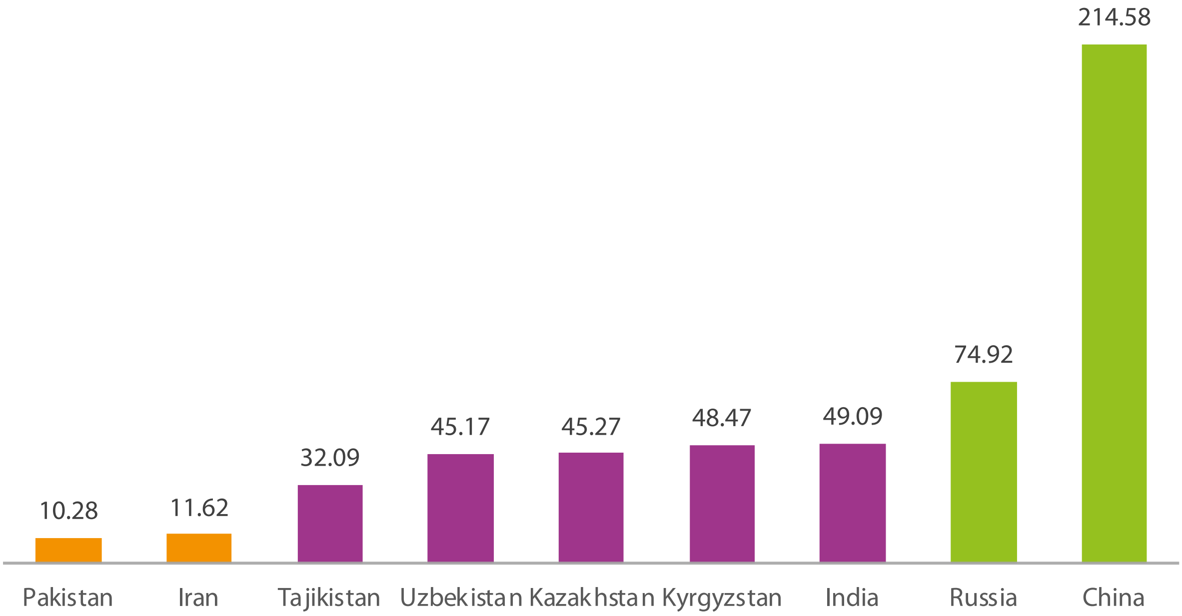


Chart 6. Median fixed connection internet speed, Mbps, 2023

Source of data: Kemp, S. 2023, 27 April. Digital 2023 April global statshot report. DataReportal. https://datareportal.com/reports/digital-2023-april-global-statshot

When it comes to fixed internet connection speeds, China still outstrips all the other SCO countries with its impressive median speed of 214.58 Mbps [225] (see Chart 6). Russia, with a median speed of 74.92 Mbps, ranks second in this category; the other SCO countries, with the exception of Iran and Pakistan, have speeds of between 32.1 Mbps and 49.1 Mbps. The difference between the top performer (China) and the lowest performer (Pakistan) is more prominent in this category – the median top speed is 20.9 times faster than the median lowest speed – than in the mobile internet speed category, where the median top speed is 13.4 times faster than the lowest.

When these two metrics are placed side by side (see Chart 7), we can see that in all the SCO countries, except Iran and Pakistan, a fixed connection is faster than a mobile connection. A potential hypothesis for this could be that six of the SCO countries are former Soviet republics (including present-day Russia, previously known as the Russian Soviet Federative Socialist Republic within the Soviet Union) in which an emphasis was placed on installing fixed communication infrastructure such as telephone lines, and today this infrastructure serves as a backbone for broadband internet.

In Pakistan and Iran, the median speed of mobile internet is considerably higher than that of fixed internet (from 1.4 to 4 times), which could be an indication that mobile technology develops faster because it offers a simpler and quicker solution to the connectivity problem.

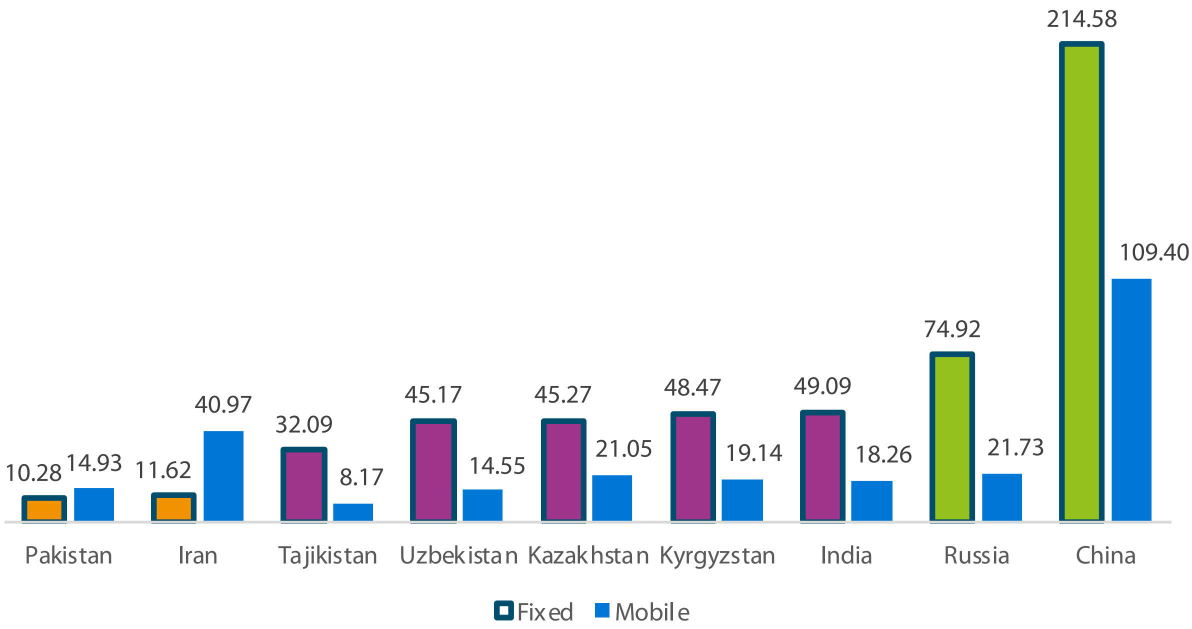


Chart 7. Median connection speed: Fixed vs mobile, Mbps, 2023

Source of data: Kemp, S. 2023, 27 April. Digital 2023 April global statshot report. DataReportal. https://datareportal.com/reports/digital-2023-april-global-statshot

Affordability of mobile internet

This indicator shows the cost of mobile data and voice high-consumption basket, measured in USD (PPP) (see Chart 8). This basket refers to the 'cheapest plan providing at least 140 minutes of voice, 70 SMS and 2 Gb of high-speed data (>256 Kbit/s) using at least 3G technology over a 30-day (or four weeks) period from the operator with the largest market share in each economy' [226].

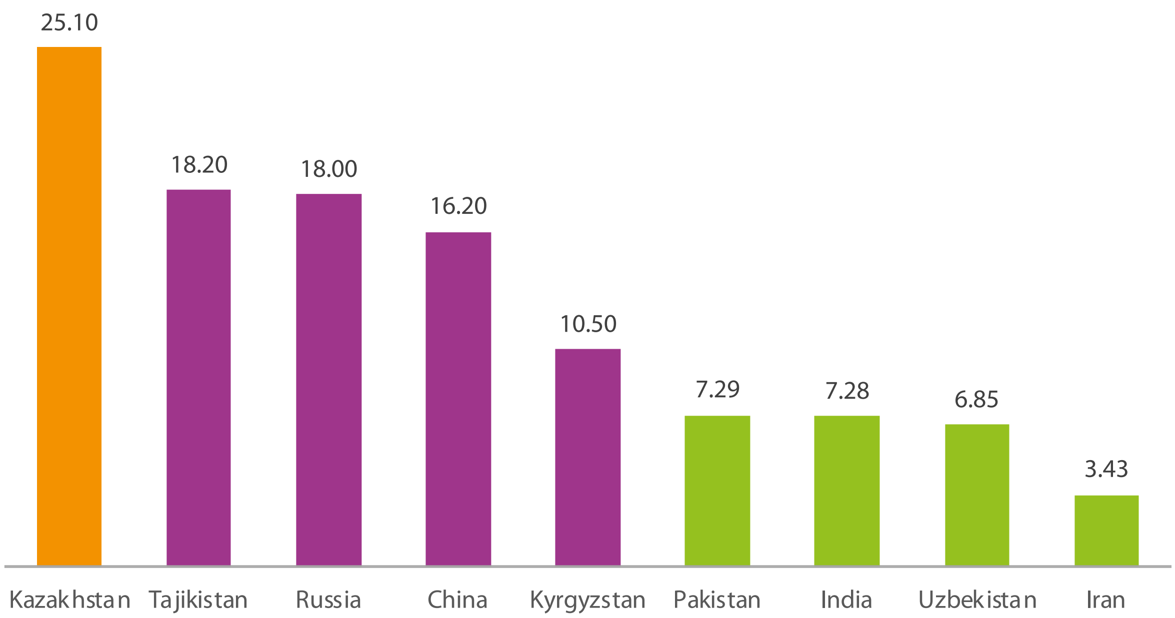


Chart 8. The cost of mobile data and voice-high consumption basket, USD (PPP), 2021

Source of data: ITU. n.d. ICT price baskets. https://www.itu.int/en/ITU-D/Statistics/Dashboards/Pages/IPB.aspx

In a departure from its performance in other categories in this chapter, Kazakhstan comes in last in terms of mobile internet affordability with a cheapest available plan price of USD 25.10 (PPP) per month. Tajikistan (USD 18.20), Russia (USD 18.00) and China (USD 16.20) were also more expensive than the other countries.

Mobile internet was most affordable in Iran – USD 3.43 (PPP) per month – and monthly costs in Uzbekistan, India and Pakistan were also below USD 10.00, although they were still at least double the costs of those in Iran. Kyrgyzstan occupied the middle ground, with its top telecom operator offering 2 Gb or more of mobile internet for USD 10.50 (PPP) per month.

Proportion of schools with Internet access

This indicator shows the percentage of schools that have internet access in each country (see Chart 9).

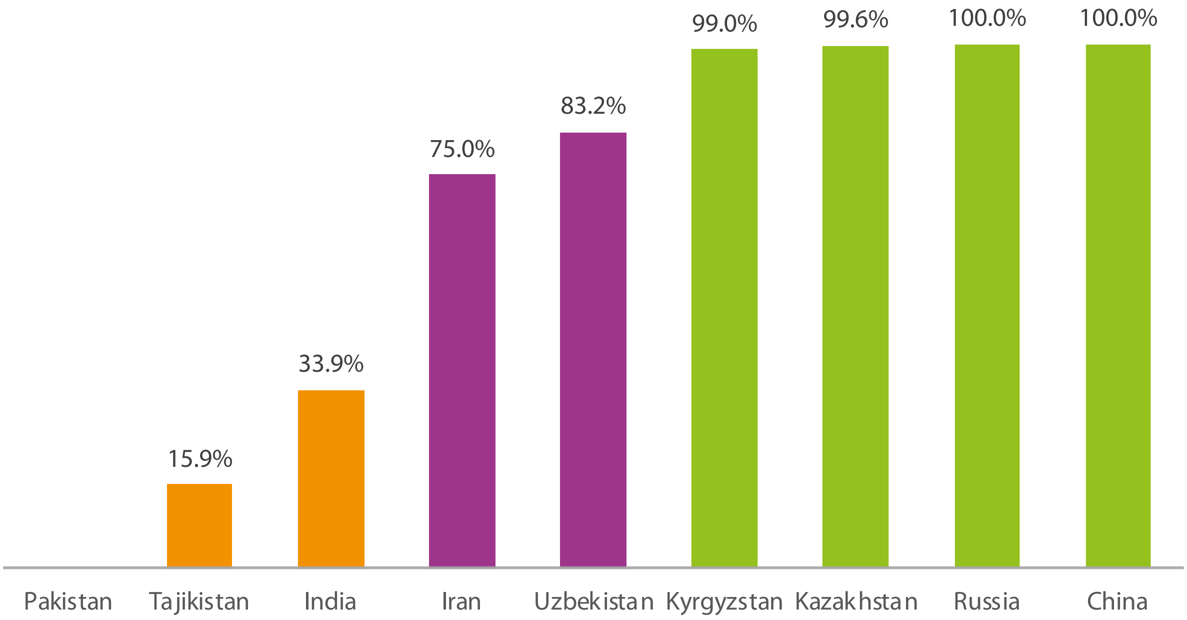


Chart 9. Proportion of schools with internet access, %

Source of data: Kemp, S. 2023, 27 April. Digital 2023 April global statshot report. DataReportal. https://datareportal.com/reports/digital-2023-april-global-statshot

Data for Pakistan were not available, so the relevant bar was left empty. Chart 9 shows that 100% of schools in Russia and China have internet access [227]. The figures for both Kazakhstan and Kyrgyzstan are slightly above 99%, which is also a remarkable achievement. A significant number of schools in Iran and Uzbekistan have internet access, but there is still a notable gap between these two countries and the top four [228].

India has a surprisingly low proportion of schools with internet access – only one-third [229] – and in Tajikistan only 15.9% of schools have internet access [230]. This is particularly surprising given that Tajikistan, like Kazakhstan, Kyrgyzstan and Uzbekistan, was part of the former USSR. It appears it has not kept up with its neighbours, despite its being a relatively small country, in terms of both land area and population.

CASE STUDIES

CHINA: Basic Smartedu

Introduction

Basic Smartedu is an online education platform that was launched in 2022 as part of the 'Smart Education of China' initiative [231] (see Figures 13 and 14). It includes a wide range of educational resources for K–12 students, covering not only the standard academic subjects taught in primary and secondary schools but also moral education, physical education, etc. There are three versions of the platform: mobile, Pad HD and desktop. All the resources are free to use and may not be used for commercial purposes by any organization, institution or individual. The language of the content and interface is Chinese only. As of July 2022, the platform has attracted 430 million visitors and 3.03 billion visits [232].

Figure 13. Smartedu: Home page

Figure 14. Smartedu: Subjects available

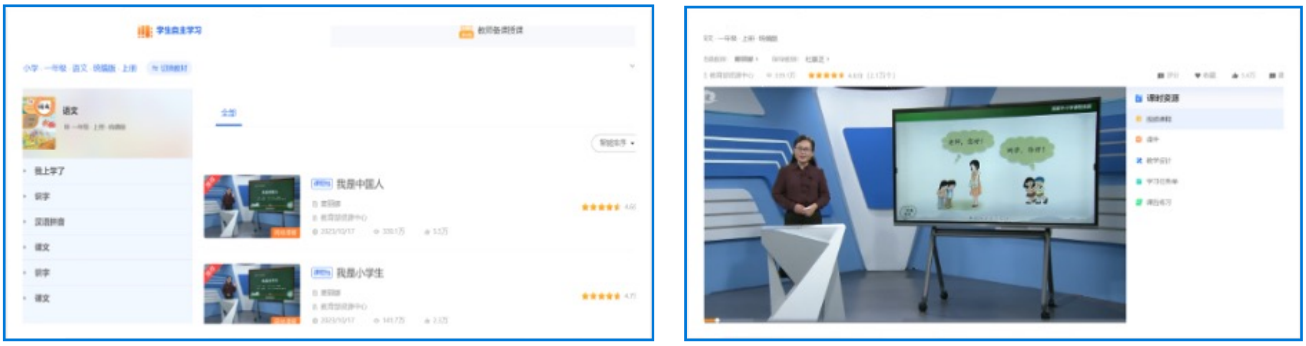
Content

By the end of December 2022, Basic Smartedu had 44,000 education resources available [233]. Although there is a 'log in' button, which suggests a requirement to register, all the modules can be accessed without registering. The resources are split into ten categories: moral education, curriculum teaching (primary and high school), physical education, aesthetic education, labour education, after-school curriculum, teacher training, family education, education reform experience and teaching materials.

We will use the content aimed at Grade 3 (primary) and Grade 9 (secondary) students to understand the platform a little better. When you access the Grade 3 page, two columns can be seen. One is intended for students' independent work, and the other is a place for teachers to organize the learning process in the classroom or online using the platform's materials. The Grade 3 curriculum contains modules on Chinese, mathematics, English, morality and the rule of law, science, music, art, sports and health, labour and technology. Each lesson consists of five parts: a video (approximately 15–20 minutes long), a presentation, a lesson plan, a learning task sheet and some homework. All the lesson resources, except the video, are presented in the form of text and images; there are no interactive exercises or tasks. Each lesson includes the speaker's name, the date the lesson was uploaded to the platform, the number of views and likes, and the lesson rating.

The Grade 9 curriculum contains modules on Chinese, mathematics, English, morality and the rule of law, physics, chemistry, history, music, art, sports and health, labour and technology. The modules are structured in the same way as described above.

Figures 15–18 show a variety of pages for Grade 3 and Grade 9 students.



Figures 15 & 16. Smartedu: Chinese language lesson, Grade 3

Figure 17. Smartedu: Maths lesson, Grade 3

Figure 18. Smartedu: English lesson, Grade 9

Parents (caregivers) and teachers

The platform has a section for teachers titled 'Nine Application Scenarios of the National Smart Education Platform for Primary and Secondary Schools'. In addition to the previously mentioned lesson resources, Basic Smartedu offers a range of training courses for teachers that cover various topics, such as ethics and teaching style, special education training, online teaching and research, etc. For parents (caregivers), Basic Smartedu has a special section titled 'Family Education', which contains approximately 100 articles and videos on topics such as family education concepts, methods and guidelines [234].

Statistics

As of 27 April 2022, the Basic Smartedu platform had amassed a total of 2.22 billion visits. Two sections, 'Features' and 'After-School Service', had 370 million visits combined [235]. In the eight provinces that were most impacted by the pandemic, the average number of daily visits to the platform exceeded 2 million [236].

On Google Play, the Basic Smartedu app has an average rating of 3.8 and more than 1 million downloads, with the latest update at time of writing in December 2023. It has a total of 73,300 reviews [237]. On the App Store, Basic Smartedu is much less prominent, with an average rating of 3.5 and approximately 63,000 reviews; the latest update at time of writing was in April 2024 [238]. The iOS app is ranked No. 10 in the 'Education' category and is designed to be used on both iPhones and iPads [239].

Figure 19 shows a selection of pages from the app.

Figure 19. Basic Smartedu: Mobile app

According to Similarweb data in March 2024, Basic Smartedu is predominantly used in China (97.13%); it is used to a much lesser extent in the United States of America (0.56%) and Hong Kong (0.54%) [240].

INDIA: DIKSHA

Introduction

DIKSHA is an Indian online learning portal and app with educational content for Grades 1–12 that was launched in 2017. DIKSHA is both an acronym for Digital Infrastructure for Knowledge Sharing and a word in Sanskrit meaning 'preparation for a religious ceremony'. It contains content for more than thirty-five subjects, including both traditional school subjects such as mathematics and geography, and vocational educational courses such as accounting and statistics. The content is available in twenty-nine Indian and seven other languages, and the interface is available in eleven Indian languages and English [241]. In addition to readily available content such as digital versions of textbooks and multiple-choice questions for a variety of topics, the platform contains content uploaded by users – for example, a video-recording of a teacher explaining algebraic equations or a Word document for a lesson plan (see Figures 20 and 21).

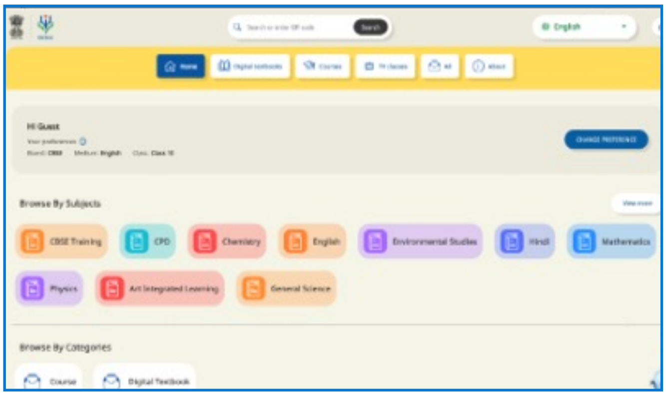


Figure 20. DIKSHA: Home page

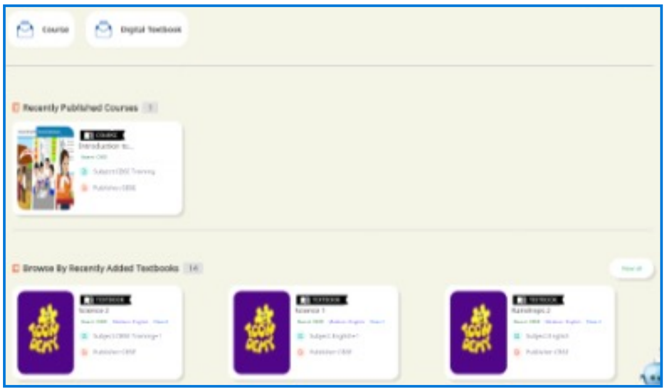


Figure 21. DIKSHA: Sample page

Content

Figure 22 shows search results for a Grade 10 student who is interested in studying mathematics in English for the Central Board of Secondary Education/National Council of Educational Research and Training CBSE/NCERT board. The types of content available are digital textbooks, explanation content, learning resources, practice question sets, electronic textbooks, teacher resources, content playlists and courses. Our hypothetical student (Grade 10, mathematics, CBSE/NCERT Board, English as the language of instruction) has access to approximately 1,300 content items. If the student selects chemistry instead of mathematics or chooses Hindi rather than English as the language of instruction, the number of items drops to approximately 200.

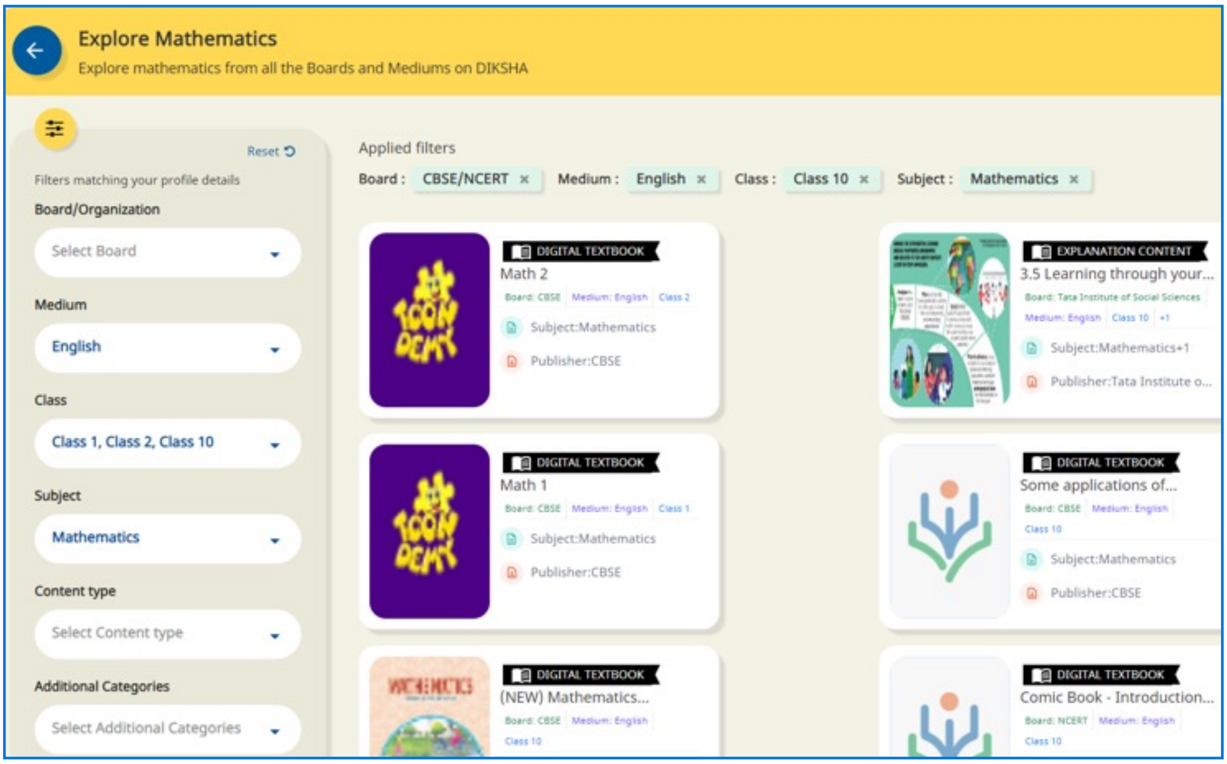


Figure 22. DIKSHA: Search results for a Grade 10 student wishing to study mathematics in English

The amount and type of content available change depending on which language of instruction is chosen. It seems that when learners select any language of instruction other than English, they are generally presented with courses only. However, when they select English as their language of instruction, they have access to much more diverse content – explanations, digital textbooks, question sets, etc. (see Figures 23 and 24).

Figure 23. DIKSHA: Sample content page

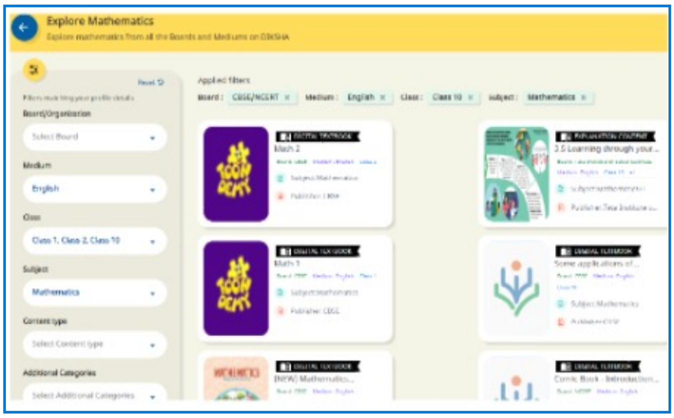


Figure 24. DIKSHA: Maths resources and filters

Features

Users can create a profile, which allows them to record their progress. One particularly interesting feature of the platform is called My Groups. It allows users to create their own group (e.g. a study group) or join an existing one (e.g. their class). Another interesting feature is that users can use QR codes, in addition to a traditional search box, to quickly find content.

One of the more striking features of DIKSHA is content contribution: since the platform was launched, it has seen 257,711 contributions by 11,800 contributors [242]. It currently offers 19,551 courses, with 174 million enrolments recorded. Out of the total enrolments, 81% are registered as having completed their course (141 million) [243].

DIKSHA has a range of advanced accessibility options: from a simple way to increase font size and brightness to an ability to increase contrast, text spacing, line height and cursor size; highlight links; pause animation and hide images; change text alignment; increase the size of the accessibility widget; and adapt the saturation level. The portal also features a button marked 'Dyslexia Friendly'.

Another feature of DIKSHA is a bot called Tara, which seems to be a simple standard questions/answers navigational tool that does not allow any user-generated text input and is mainly focused on helping users find their way around the portal.

Statistics

As of 2024, DIKSHA had amassed 5.4 billion learning sessions and 63 billion learning minutes, as stated on its website. In terms of learning sessions, it is used most in the State of Uttar Pradesh (990 million), State of Madhya Pradesh (540 million), State of Rajasthan (510 million), State of Bihar (480 million) and State of Karnataka (430 million) [244]. Approximately 600 million people – around 41.8% of the total population of India – live in these five states [245]. Given that they generate 2.52 billion learning sessions (54.4% of the total), there is a moderate imbalance in how the platform is used throughout India – 41.8% of the population generate 54.4% of the learning sessions. This can be explained by a range of factors such as differences in the proportion of children or students or other learners who can access the platform (internet access, device affordability, etc.).

According to Google Trends data for 2024, the term 'DIKSHA' was most searched in India (100), Mauritius (79), Nepal (25), United Arab Emirates (12), Pakistan (6), Bangladesh (6), Australia (3), Canada (2), Malaysia (1) and the United Kingdom of Great Britain and Northern Ireland (1). However, if the 'Education & Jobs' category is selected, only India is shown (100), which seems to be a better reflection of interest in the platform [246].

On Google Play, the DIKSHA app (see Figure 25) has an average rating of 4.2 and over 10 million downloads; at time of writing the latest update was in March 2024 [247]. The app has a total of 429,000 reviews, and the interesting part is that every review is answered by the authors (shown as 'Ministry of Education, Govt of India') with either a 'thank you' or an 'apologies' reply [248]. On the App Store, DIKSHA is much less prominent and has a much lower average rating of 2.7, only 203 reviews and the latest update, at time of writing, in December 2022 [249]. The iOS app features nine languages (Chinese, English and seven other European languages) and is designed for iPads, although it can also be used on iPhones.

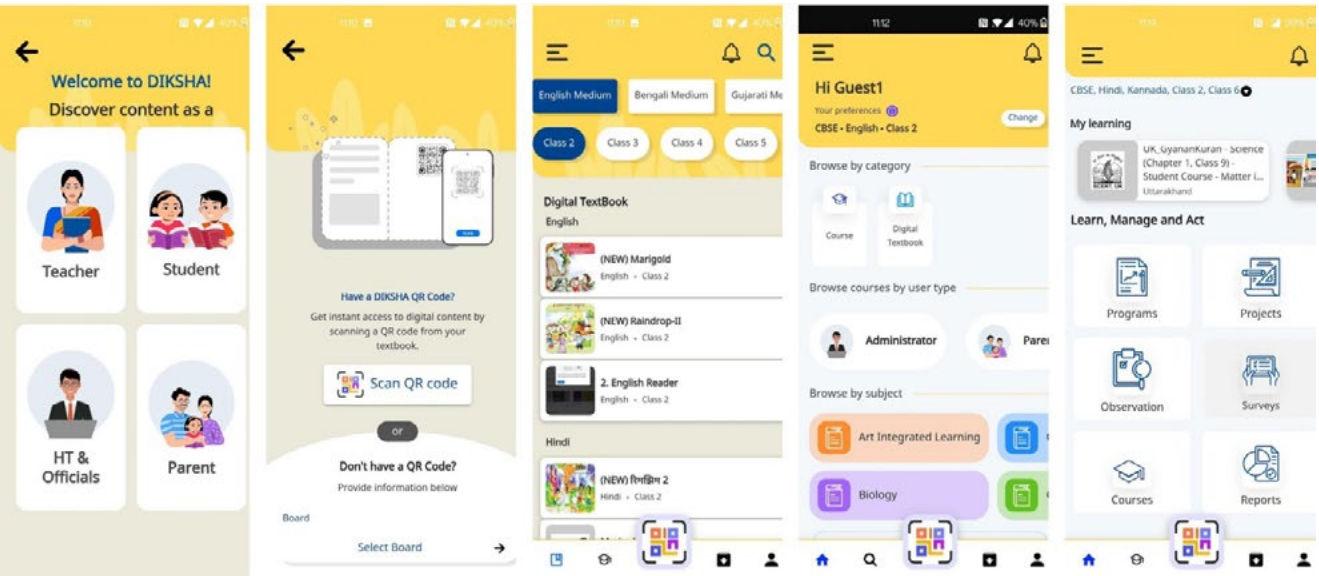


Figure 25. Screenshots of DIKSHA mobile app

Despite extensive research, we did not find a dedicated countrywide DIKSHA YouTube channel, but we did find a separate channel for DIKSHA in the State of Andhra Pradesh with 86,700 subscribers, 354 videos and 6.2 million total views [250]. The most popular video, with 35,000 views, is about registering on the platform [251]. The content of this channel seems to be for teachers, rather than students.

IRAN: SHAD

Introduction

The Student Educational Network (Shad) is the official application of the Iranian Ministry of Education and was designed to be the primary platform for virtual education in Iran during the COVID-19 pandemic [252]. It facilitates seamless interaction among teachers, students and administrators through the exchange of files, videos and assignments, making it a comprehensive system for managing online classes. Teachers, students and school administrators can create virtual schools and classrooms once they have registered. Users need access to a smartphone or laptop and an internet connection to use this platform effectively – a potentially challenging requirement for some students, particularly those in underprivileged areas.

Features

Shad is available in both mobile app and website versions. Users must register in the programme using their national code – the ten-digit identifier number assigned them at birth – and date of birth. It is possible to download the Android version from the official website; there is a separate link for the desktop version and for iOS, both of which require a phone number to log in.

Once the students have installed the application and entered their national code, they are automatically placed in their class group, although administrators and teachers can also add students to classes manually. The application operates under the supervision of the Ministry of Education of Iran, ensuring that all information is registered in a unified system [253].

Shad's structure mirrors that of a traditional school. Students join virtual classrooms, where teachers are present, and class schedules are set by school principals, thus ensuring continuity in the teaching and learning process. Students are expected to turn up at the scheduled time, just as they would do in traditional classrooms. Principals and administrative staff oversee classroom activities, monitoring teachers' performance and tracking students' attendance.

Figure 26 shows a screenshot of Shad's services and facilities.

Shad offers numerous practical features that benefit both teachers and learners. One notable feature is the 'Official Content' section, accessible from the 'Services' menu on the platform's home page. This section contains high-quality educational materials, including specialized resources for students with SEN and their instructors, for all subjects, prepared and uploaded by experienced teachers nationwide. The content is organized according to education level – pre-school to secondary school – and each subject and grade level has its own dedicated channel.

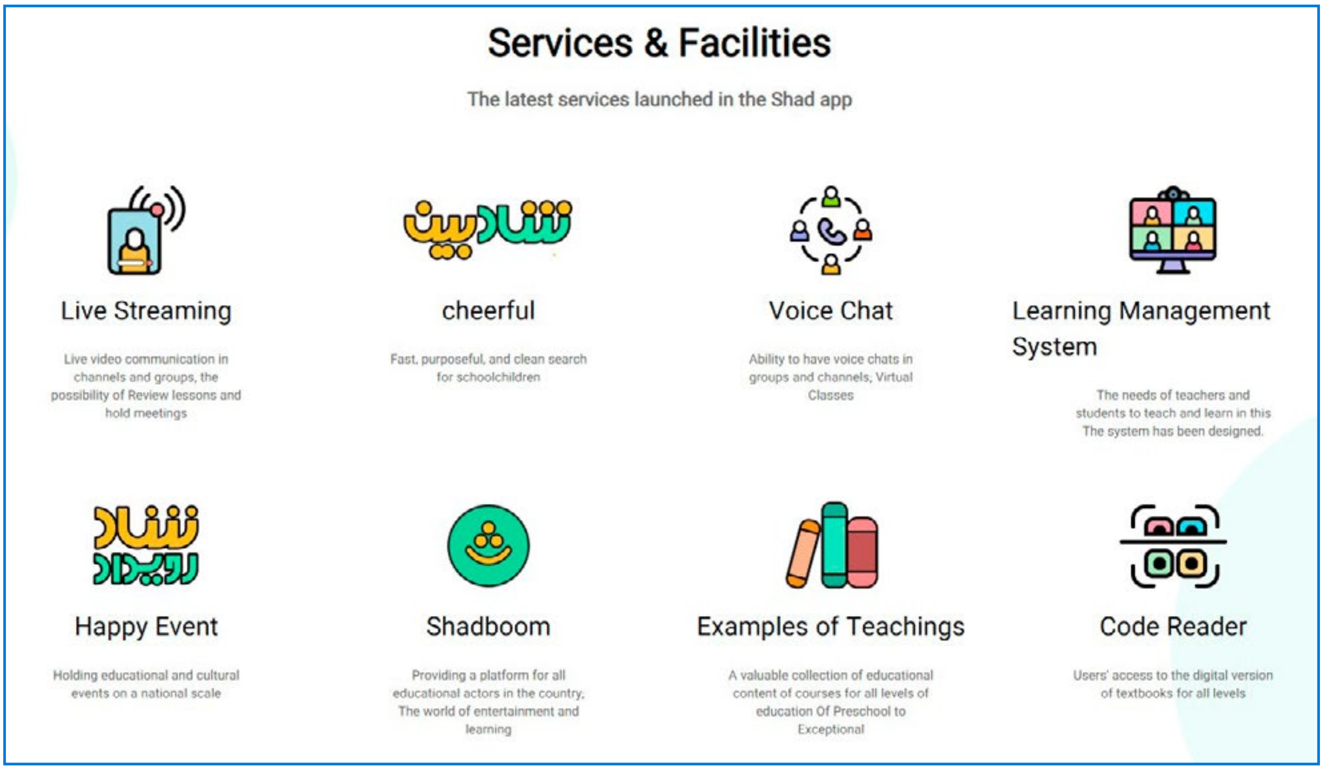


Figure 26. Shad: Services and facilities

Another notable feature of the platform is Shad Messenger, which fosters connectivity within the education community. Administrators and teachers can create groups in which to distribute various types of content, such as text, audio and video files of up to 1.5 gigabytes. They can also set up unique invitation links for groups; broadcast live, interactive sessions; gather real-time feedback; conduct surveys and manage notifications (e.g. to alert users to a new post or message). The platform has effective administrative tools – for example, multiple administrators can be assigned and given permission to view member and administration lists, moderate content and, if necessary, dissolve groups.

The app can be integrated with other messaging apps such as Rubika, Eitaa, Soroush Plus, Gap, Bale and iGap, making it a versatile resource [254].

Figure 27 shows some examples from the Shad app interface.

The Shad app has been revised significantly since it was first launched. Early versions of the app were criticized by students and teachers, but the problems appear to have been resolved [255].

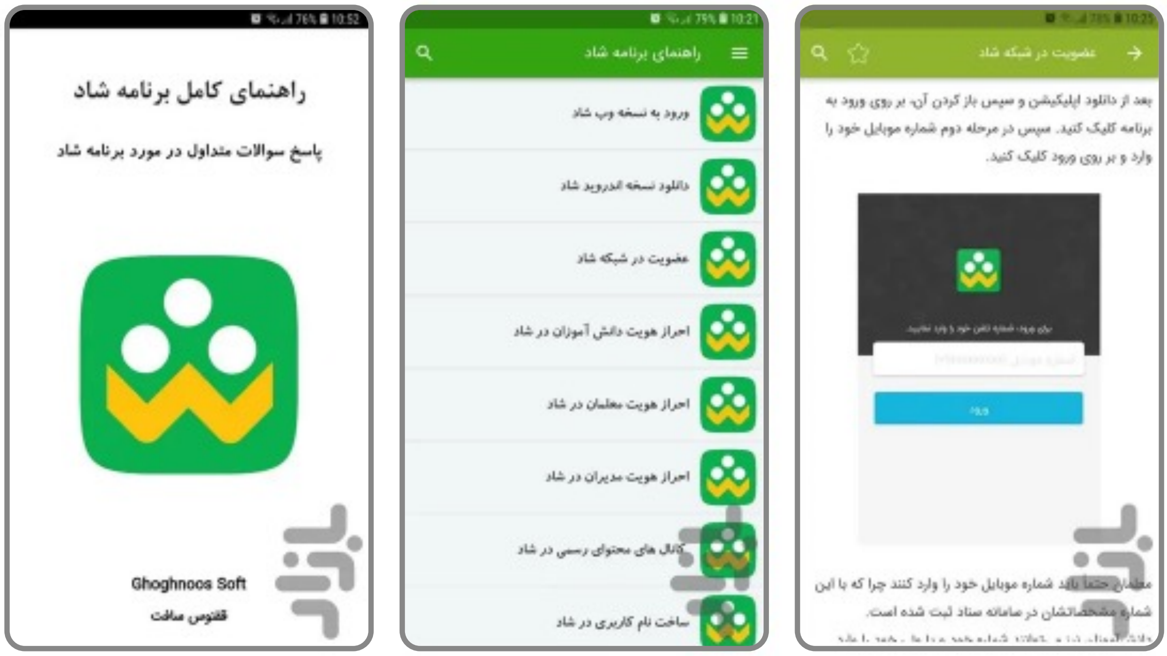


Figure 27. Shad: App interface
Source: https://cafebazaar.ir/app/com.ghsoft.shad?l=en

Statistics

As of December 2024, the statistics on the app's official website indicate that Shad is the largest educational app in Iran, with 34 million installations. It has a maximum of 12 million daily active users, 15 million weekly active users and 20 million monthly active users [256].

KAZAKHSTAN: BilimLand

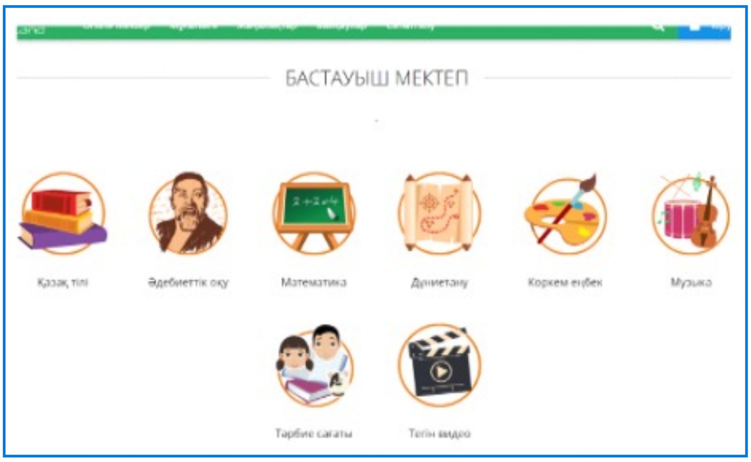
Introduction

BilimLand, launched in 2011 by the Bilim Media Group, was the largest educational online platform in Kazakhstan as of 2020 [257]. The core of the platform is a library of digital lessons presented as engaging animated and video explanations, simulators and training exercises, as well as interactive assignments of varying difficulty. A key element of the platform is the 'Online Mektep' module, developed in partnership with Nazarbayev Intellectual Schools. This module covers all forty-two school subjects for Grades 1–11 in Kazakh and Russian [258]. Other BilimLand services offer content in English as well.

The Kazakh version of the platform's content is more extensive (including courses in Kazakh literature and audio anthologies in the Kazakh language), while the English version for the same subjects is focused on the international K–12 programme and can help learners prepare for international tests and future study at an English-medium university. Otherwise, all courses are identical.

The BilimLand interface is available in English, Kazakh and Russian. In addition to video lessons and assignments for school subjects, it offers courses in twenty-first-century skills such as digital marketing, Scratch, Photoshop, etc.

Figures 28 and 29 show sample pages from the platform showing the range of subjects on offer.



Figures 28 & 29. BilimLand: Subject selection

The BilimLand ecosystem also includes the iTest online simulator for preparing for the national matriculation exam (ENT) and end-of-year exams, iMektep interactive lessons for primary school students in Kazakh, the Twig-Bilim global collection of scientific and documentary films with educational materials and tests, a virtual laboratory, school preparation courses, resources for teachers, etc.

In addition, BilimLand offers several offline solutions to help teachers and students in rural areas access Bilim Media Group's educational resources without an internet connection. These include BilimBook (a personal learning device), an interactive panel, a multimedia kit for schools, the All-in-One educational monoblock and an IT classroom.

Content

BilimLand contains more than 45,000 digital lessons (animated and video explanations), 75,000 ENT/VOUD test questions and 500,000 interactive assignments in various school subjects, including simulators [259]. Additionally, the platform incorporates gamification into the learning process. Students must register to use the platform. The platform's content is paid, but there is an option to take several lessons for free in each subject. Subscriptions to the platform's courses are available for three, six or twelve months.

Figures 30–33 show some sample pages from the platform.

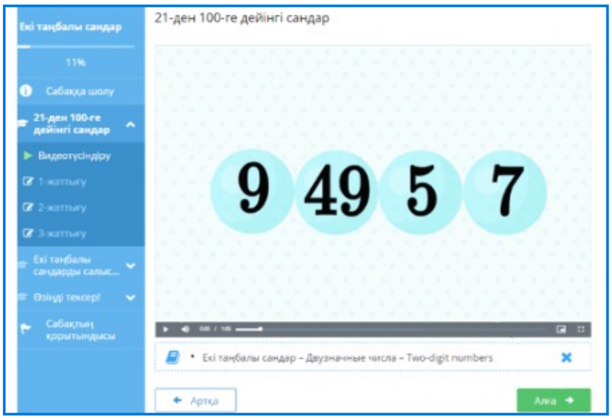


Figure 30. BilimLand: Mathematics lesson, Grade 2

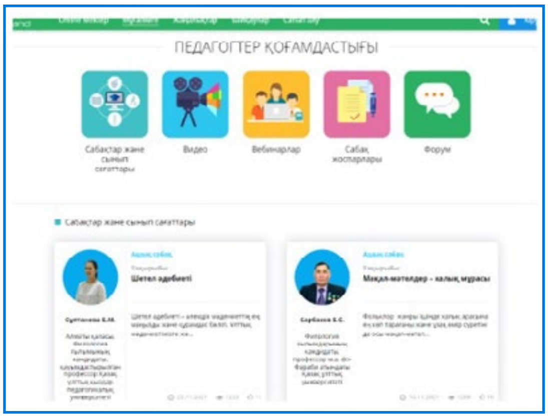
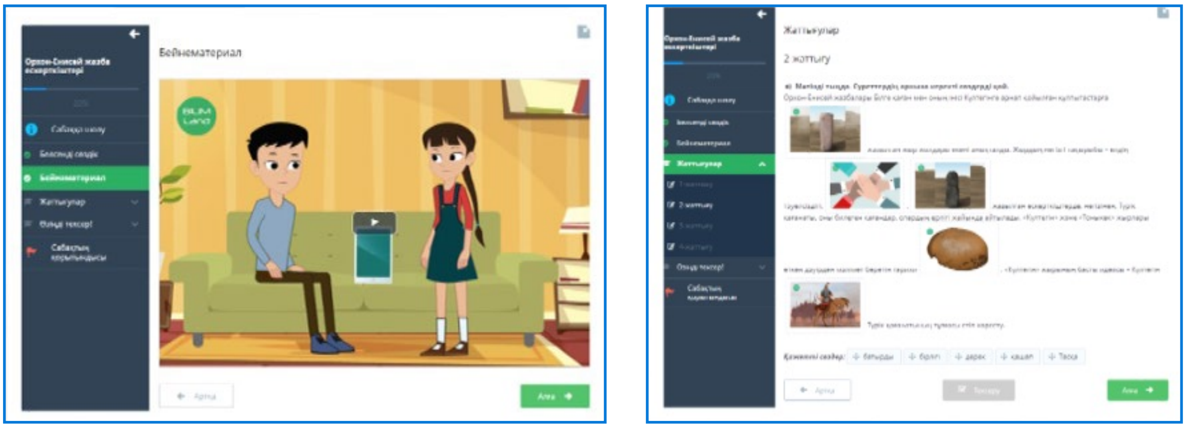


Figure 31. BilimLand: Teachers' tools



Figures 32 & 33. BilimLand: Kazakh lesson, Grade 2

Statistics

More than 7,000 schools, universities, TVET institutions and kindergartens were subscribed to BilimLand in 2019 [260]. More than 2.3 million students and 230,000 teachers across Kazakhstan are registered on the platform [261]. In the 2020/21 academic year, more than 350 million online lessons were conducted and 2.5 billion assignments and exercises completed on the platform [262].

On Google Play, the app has an average rating of 3.8 and over 1 million downloads, with the latest update at time of writing in December 2023 and a total of 73,300 reviews [263]. On the App Store, OnlineMektep is much less prominent, with an average rating of 4.3, only 2,700 reviews and the latest update in January 2022. The iOS app is designed to be used on both iPhones and iPads [264]. Figure 34 shows some screenshots from the app.

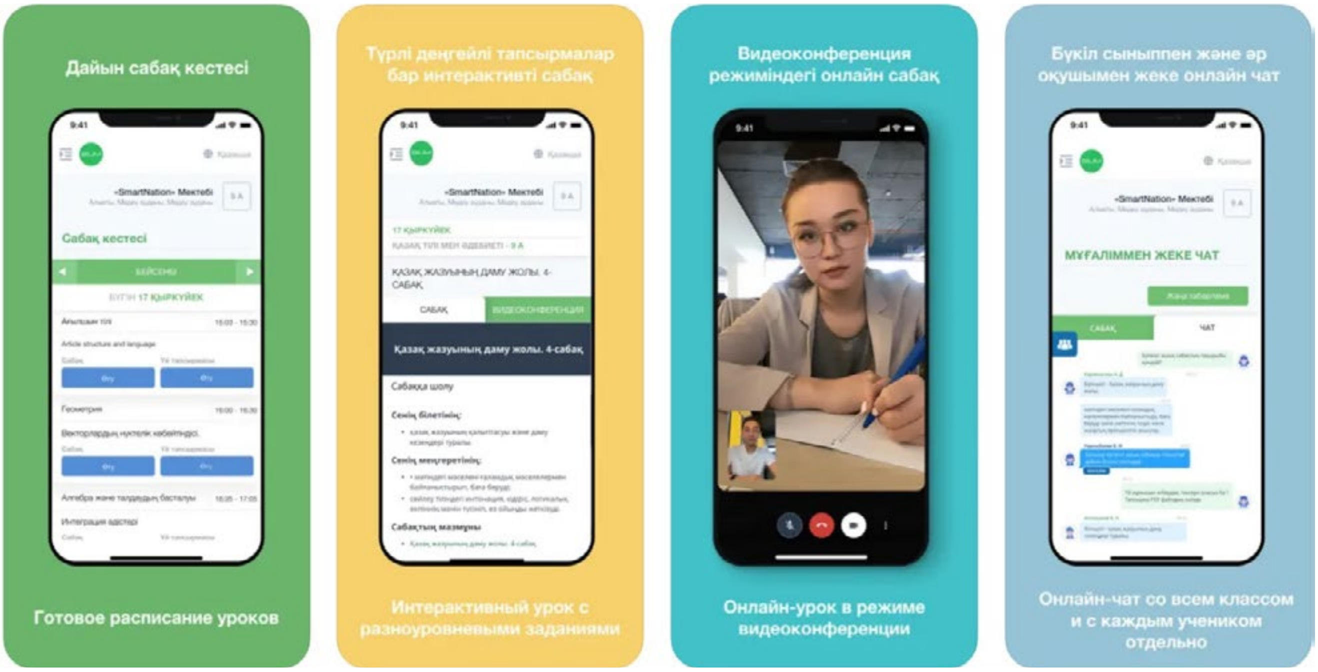


Figure 34. BilimLand: Sample screenshots from the app

BilimLand has its own YouTube channel. As of December 2024, it has 130,000 subscribers and 1,599 videos and had amassed more than 12 million total views [265]. The most popular videos are iMektep Health [266], with 209,000 views, and Instructions for using OnlineMektep [267], a promotional video with 181,000 views.

Google Trends data for 2019–2024 show that BilimLand is predominantly used in Kazakhstan (100). A much smaller number of users come from Uzbekistan (1), Russia (1) and the United States of America (1) [268].

KYRGYZSTAN: iBilim

Introduction

iBilim, an initiative of the Kyrgyzstan Government, is an online learning portal for primary school students (Grades 1–4), their parents (caregivers) and teachers. Seven subjects are covered: mathematics, Kyrgyz language, art, music, Russian language, English language and citizenship (essentially, country studies), which includes content that is usually covered in primary school science and geography [269]. The content and interface are available in both Kyrgyz and Russian.

The Taalim-Forum Foundation developed iBilim by order of the Kyrgyzstan Ministry of Education and Science. The content was reviewed by independent experts and approved by the Academic Council of Kyrgyz Academy of Education before the platform entered the pilot-testing phase [270]. The total cost of development was USD 190,000, the bulk of which was spent on content development, translation and training teachers to use the platform. The portal was pilot tested in 60 schools, and in September 2018 it was made available to all learners [271]. Since 2021, the portal has been hosted on its own website (https://ibilim.edu.gov.kg/).

Figure 35 shows the Kyrgyz version of the platform's home page.

Figure 35. iBilim: Home page (Kyrgyz version)

Content

The content for every subject consists of several lessons. Each chapter contains an introductory text, a short video (1–2 minutes) and a few practical tasks. All video and audio materials are professionally recorded. Every lesson includes a short test and a tab titled 'Interesting Facts', which, as the title suggests, contains interesting facts, presented as images, infographics, slides or animations. The overall design of the portal is very colourful and child-friendly. The portal works equally well in both languages (Kyrgyz and Russian), although it is evident that different sections, chapters and lessons were likely prepared by different authors.

Much of the content of the portal is localized to reflect Kyrgyzstani culture and context. The music, art, English and citizenship modules all contain country-specific learning content – for example, the English module includes a section about the renowned Kyrgyz author Chinghiz Aitmatov.

Figure 36 shows an example of a page in Kyrgyz and Figure 37 shows an example of a page in Russian.

Figure 36. iBilim: Mathematics lesson in Kyrgyz

Figure 37. iBilim: Music lesson in Russian

Parents (caregivers) and teachers

iBilim also offers a few modules for parents (caregivers) and teachers. The parents' (caregivers') module is only a single page with six embedded videos on the importance of reading. The teachers' module contains general information about the portal, the developers and links to external resources and additional multimedia materials.

Features

The portal can be easily accessed via its web page and does not require user registration. The downside of this is that it does not offer personalized learning or the option to record user progress. It contains some assessments in the form of tests. iBilim does not have an app-based version (iOS or Android), although there is a mobile version of the website in addition to the browser version.

Figures 38 and 39 show sample pages from the desktop version of the portal.

Figure 38. iBilim: Citizenship (country studies) lesson

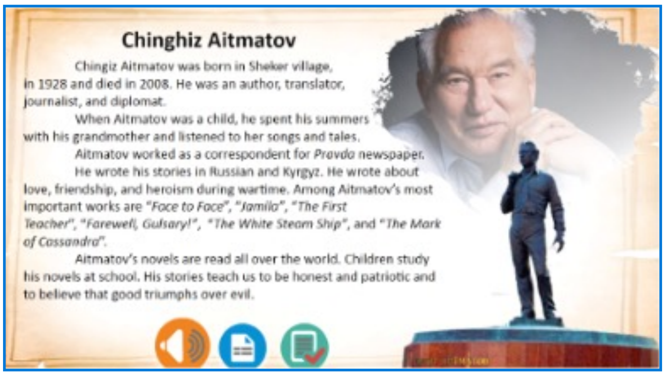


Figure 39. iBilim: Cultural element in the English curriculum

In addition to the videos that are available on the portal, there is a separate YouTube channel which features 147 videos. The videos have attracted a total of more than 1.4 million views and the channel has more than 17,000 subscribers [272]. The most popular video on the channel is a mathematics video [273] (counting from 1 to 1,000 in Kyrgyz, with 176,000 views). A short promotional video on the site features the platform's very own original iBilim song [274].

Statistics

Google Trends data for 2024 indicate that iBilim is predominantly used in Kyrgyzstan (100). It is also used in Türkiye, albeit very little (1) [275]. Overall, the learning portal is simple to use and could be beneficial even to learners with a low level of digital literacy.

PAKISTAN: SABAQ

Introduction

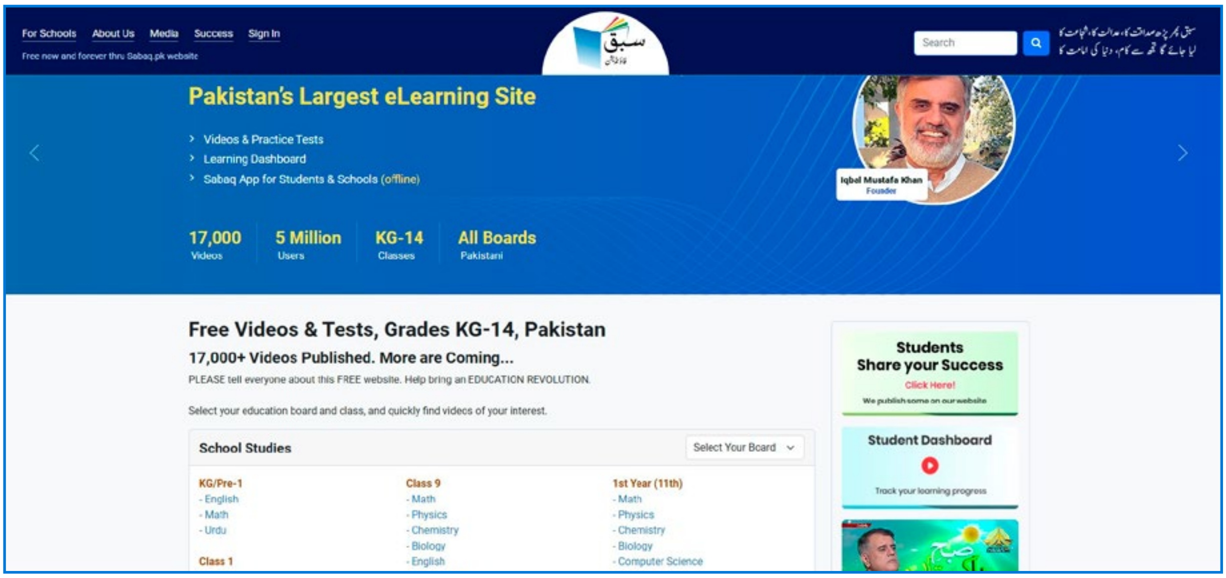
SABAQ is the largest and most popular content provider in Pakistan, with 5 million users annually, as stated by its owner, the Sabaq Foundation, which was founded in 2012 by Iqbal Mustafa Khan as a non-profit organization [276]. The platform provides educational content for students in K–Year 14 in the form of more than 17,000 video lectures and practice tests for 11 subjects: English, Urdu, mathematics, science, computer science, physics, chemistry, biology, general science, general mathematics, statistics and accounting. The number of subjects available differs from grade to grade – some grades have only three subjects on offer, while others have up to nine (see Figures 35 and 36). The content covers six educational boards: Federal, Punjab, Sindh, KPK, Balochistan and Cambridge/Oxford. The languages of instruction are English, Hindi and Urdu. SABAQ also has an Android app that allows users to download educational content and view it later without any internet connection. This option is designed as a response to the problem of unreliable or non-existent internet access, especially in rural areas.

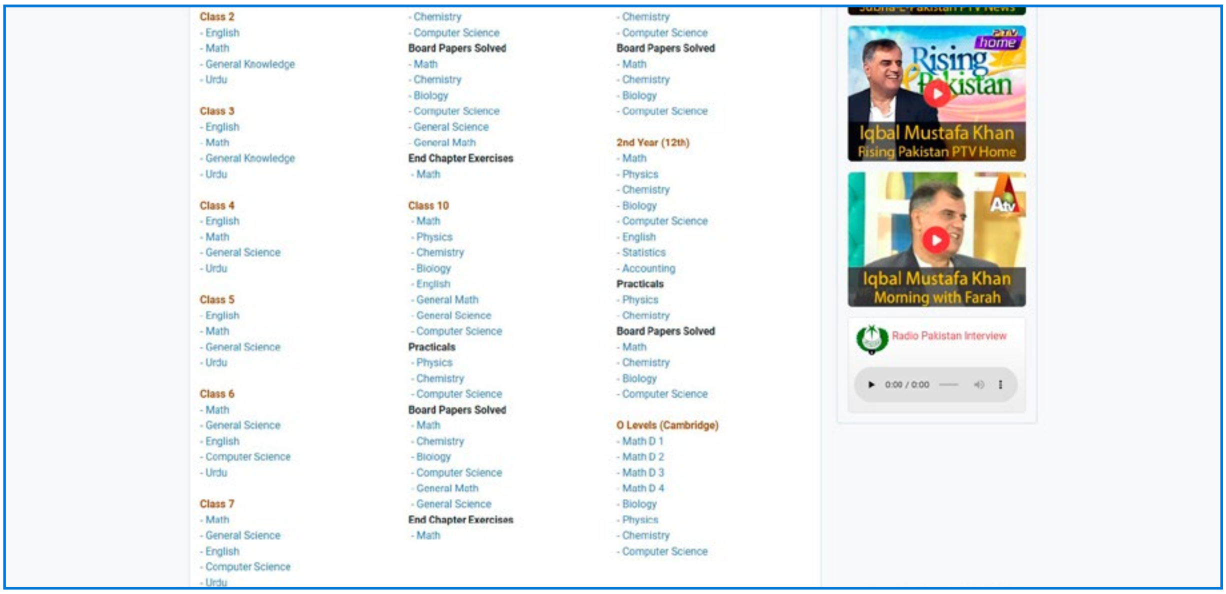
The platform also provides courses for university-level studies (finite mathematics, advanced financial accounting, management accounting), preparation courses for Pakistani college entry exams (Engineering College Admission test [ECAT] and Medical College Admission test [MCAT]), civil service entry exams (CSS) and functional skills courses for Microsoft Office (Excel, Word and PowerPoint).

During the COVID-19 pandemic, SABAQ offered its content for free to the educational authorities so that it could be used for the state-launched educational TeleSchool television channel. At time of writing, approximately 70% of content broadcast by this channel is still from SABAQ; 100% of the content for Grades 9–12 is from SABAQ [277]. The SABAQ platform can currently be used for free, and the Sabaq Foundation promises on their website that it will always be free. Figures 40 and41 show some of the content offered by SABAQ.

Content

The content of each course is available directly from the home page. For example, if a student chooses physics for Grade 9, they are asked to select the examination board they are going through. They are then presented with a list of chapters and topics; each topic has a certain number of explanatory videos and practice tests.





Figures 40 & 41. SABAQ: Content available for various grades and subjects

All the videos for the different subjects and different year groups are hosted on the platform's YouTube channel, 'SABAQ Foundation – Free Videos & Tests, Grades K-14' [278]. As mentioned above, the videos are available in English, Hindi and Urdu, but videos in Hindi and Urdu often use English terminology – for example, words such as 'perpendicular' in mathematics – and display English terms on the screen – for example, 'sister chromatids' in biology – while the teacher is speaking in English, Hindi or Urdu.

Another useful resource is practice tests, which are available in the form of multiple-choice questions. If a student gets the answer wrong, the platform gives them a hint and allows them a second attempt at the question. If the student gets the answer wrong again, the platform shows them the correct answer. At the end of the practice session, learners are given their assessment results and a star rating, which hints at some elements of gamification.

Figures 42–45 show some pages from the platform.

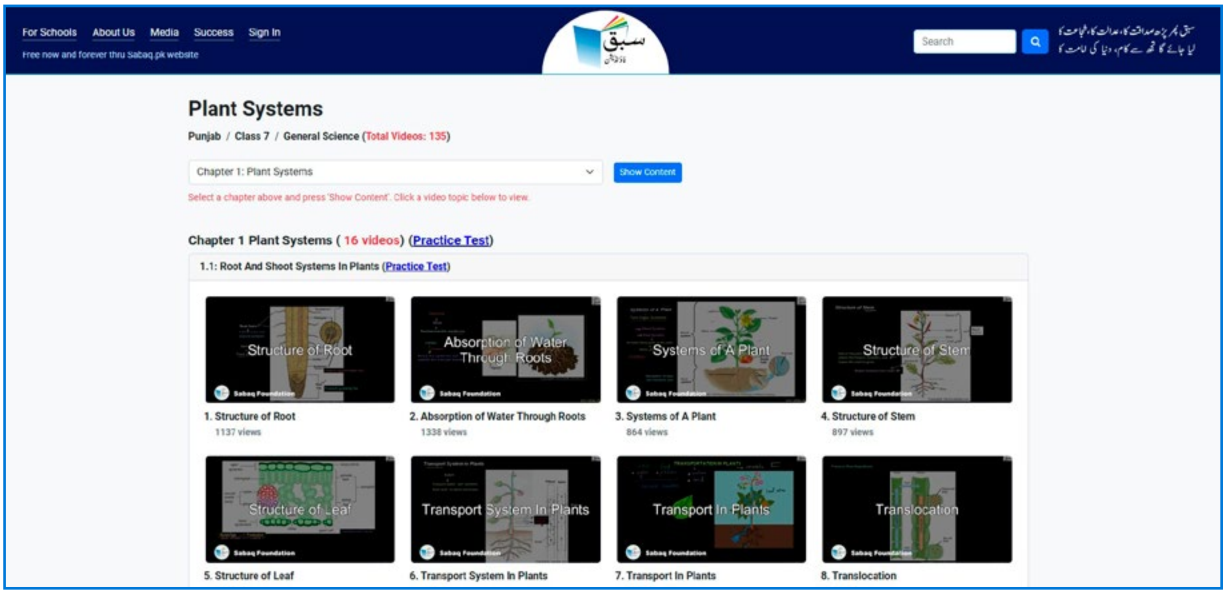


Figure 42. SABAQ: Sample contents of a chapter, Grade 7

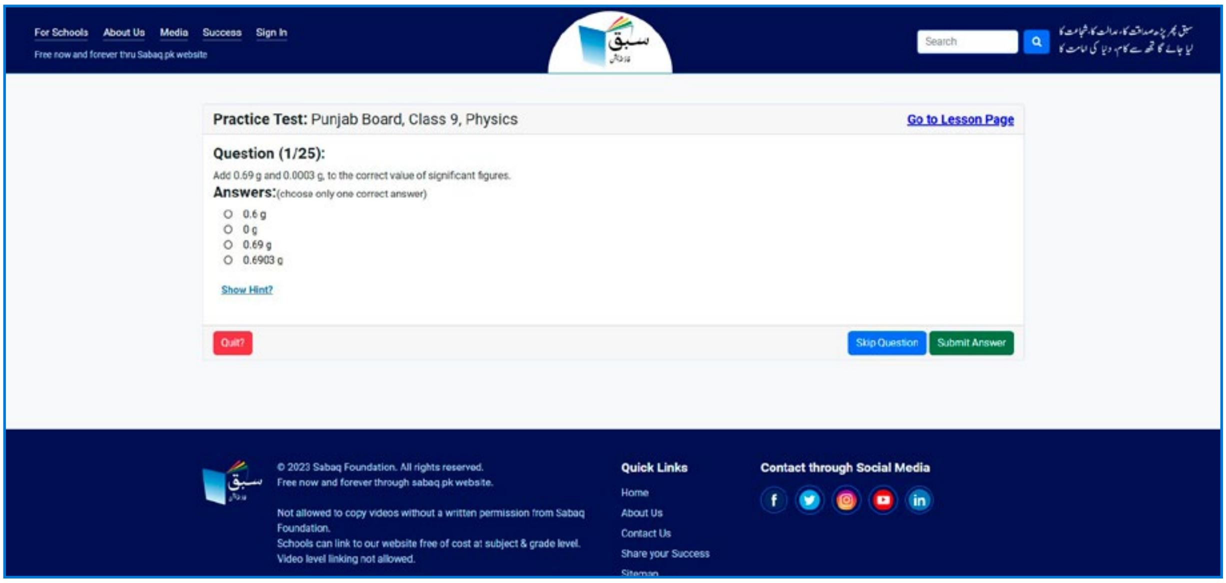


Figure 43. SABAQ: Physics practice tests, Grade 9

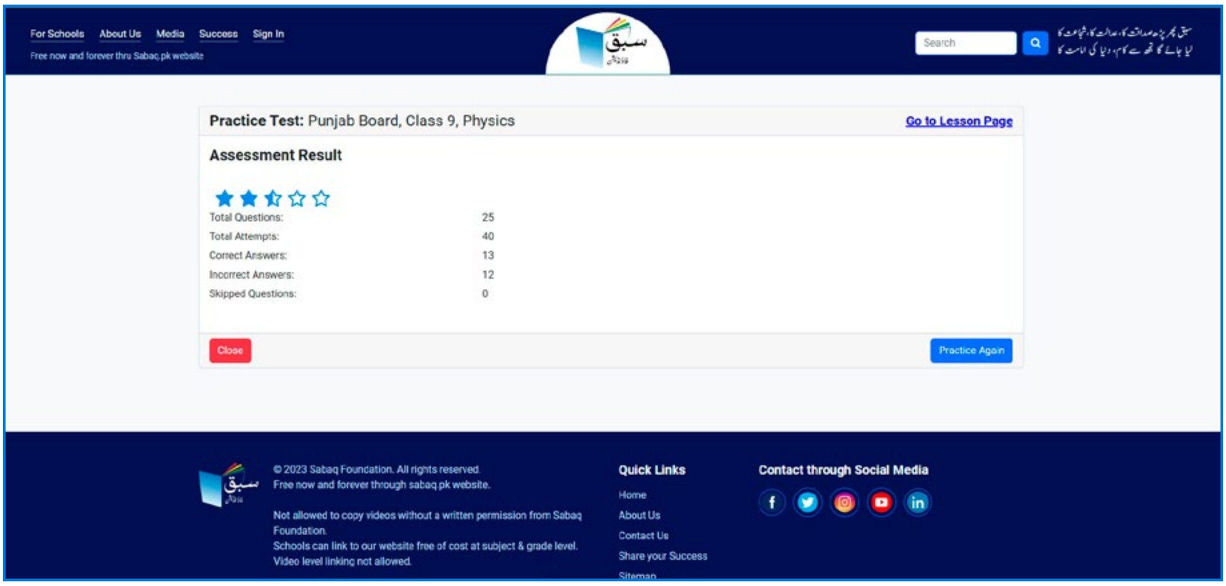


Figure 44. SABAQ: Assessment results

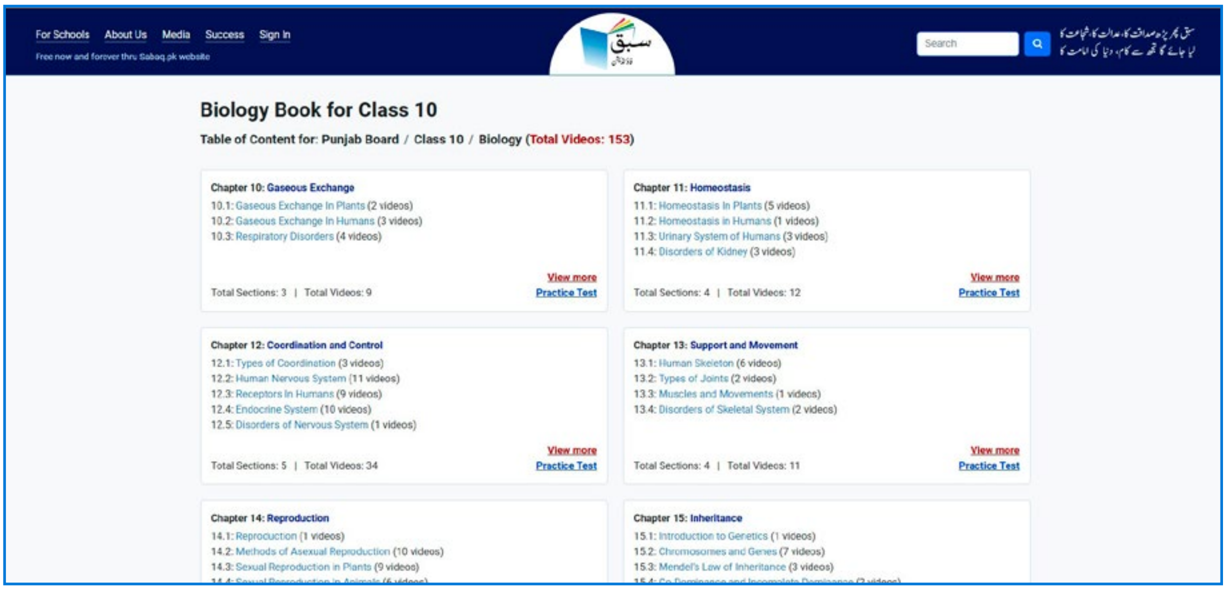


Figure 45. SABAQ: Biology page, Grade 10

Features

Users can access the platform content, both videos and practice tests, without having to sign in, but if they do sign in, learners can track videos they watched and record their progress with practice tests. Learners can sign in through their Google or Facebook account.

SABAQ offers schools in Pakistan the opportunity to use a blended learning approach, which can be implemented in two different ways. One option is for the school to buy pre-configured SABAQ Android Boxes (costing approximately USD 200) with standard 128/256 GB memory cards loaded with all the SABAQ videos for all subjects for one of the Pakistani examination boards [279]. This box can then be connected to a TV panel (preferably a large one) and used in any classroom to show the videos, with no need for an internet connection. The other option is very similar, with the main exception being that schools can buy non-SABAQ Android Boxes of their choice, configure them manually and connect them to a fast internet connection for a one-off session to download all videos in bulk from the SABAQ website, and then use it as described above, without further need for an internet connection.

SABAQ highlights that in addition to students benefiting from those learning videos, the teachers can strengthen their knowledge and improve their teaching techniques if they watch the videos when they are planning their lessons.

The SABAQ website does not offer any identifiable accessibility features, so learners with SEN or disabilities need to use their browsers' built-in accessibility features. It does, however, have a mobile version, which is especially important for Pakistani students from disadvantaged backgrounds, most of whom have access to the internet via mobile devices only.

Statistics

SABAQ is considered to be the largest and most popular e-learning content provider in Pakistan, with 5 million users annually (as of December 2023), as stated on their website [280].

Google Trends data for the past 12 months – collected in April 2024 – show that the keyword 'SABAQ' was most searched in Pakistan (100), Kazakhstan (99), Kuwait (16), Uzbekistan (6), United Arab Emirates (6), India (5), Saudi Arabia (2) and Malaysia (2) [281]. However, the word 'sabaq' exists in other languages, which could skew the results. When the 'Education & Jobs' category is chosen on Google Trends data, the 'SABAQ' keyword appears to have been searched in Pakistan only (100) [282].

On Google Play, the SABAQ app (see Figure 46) has more than 100,000 downloads, with the latest update at time of writing in March 2024 [283]. The app appears to have no reviews, and hence there is no average rating. SABAQ does not have an app for the iOS platform.

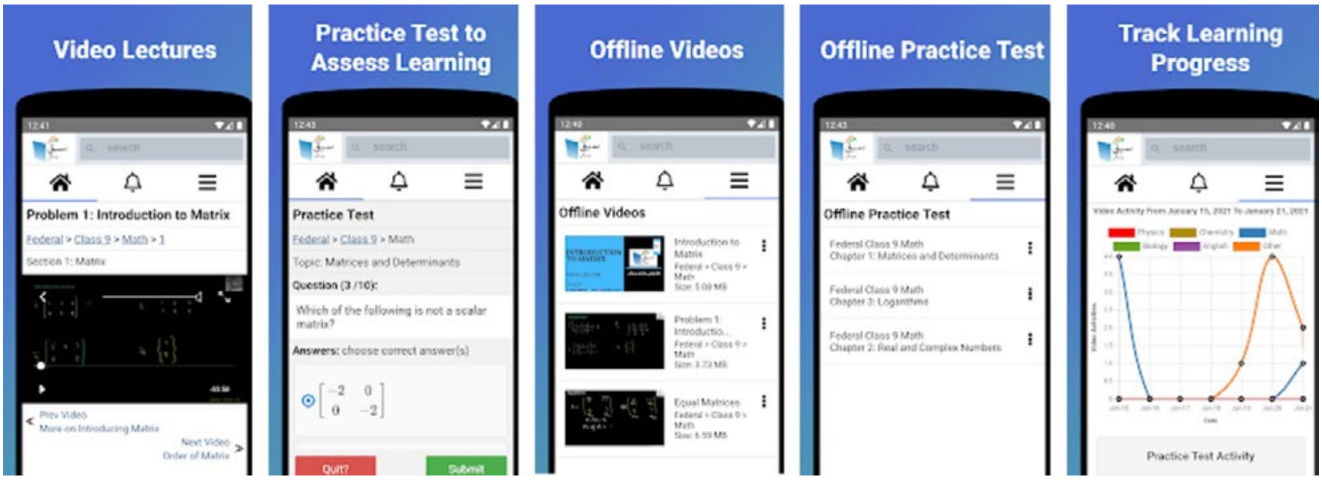


Figure 46. SABAQ: Mobile app

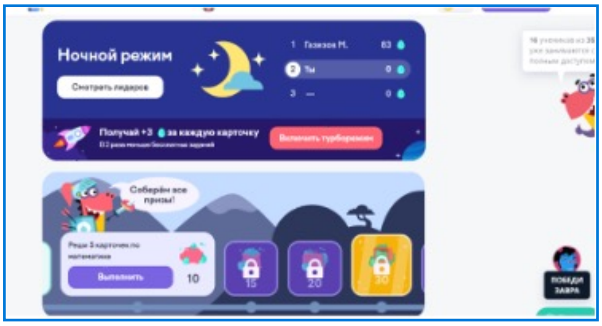
As mentioned above, SABAQ has a very popular YouTube channel. It was launched in 2012 and, as of December 2024, features more than 19,000 videos and has more than 550,000 subscribers and over 90 million views in total [284]. The most popular video on the channel, a fourteen-minute English lesson for Grade 2 on arranging words in alphabetical order, has amassed over 825,000 views [285]. The channel keeps expanding, with batches of videos being added periodically – monthly, weekly and sometimes even daily.

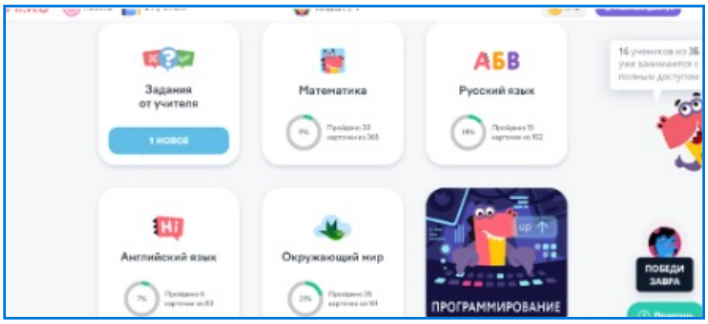
RUSSIA: Uchi.ru

Introduction

Uchi.ru, the largest Russian e-learning provider, was founded in 2012. The platform provides online courses for twelve school subjects for Grades 1–11, state exam preparation courses and extracurricular, soft skills and interdisciplinary courses. In addition, Uchi.ru conducts online subject knowledge contests (Olympiads) and provides literacy and soft skills diagnostic tools, webinars and online conferences for teachers [286]. The language of the platform is Russian.

Figures 47 and 48 show sample student pages from the platform.





Figures 47 & 48. Uchi.ru: Student pages

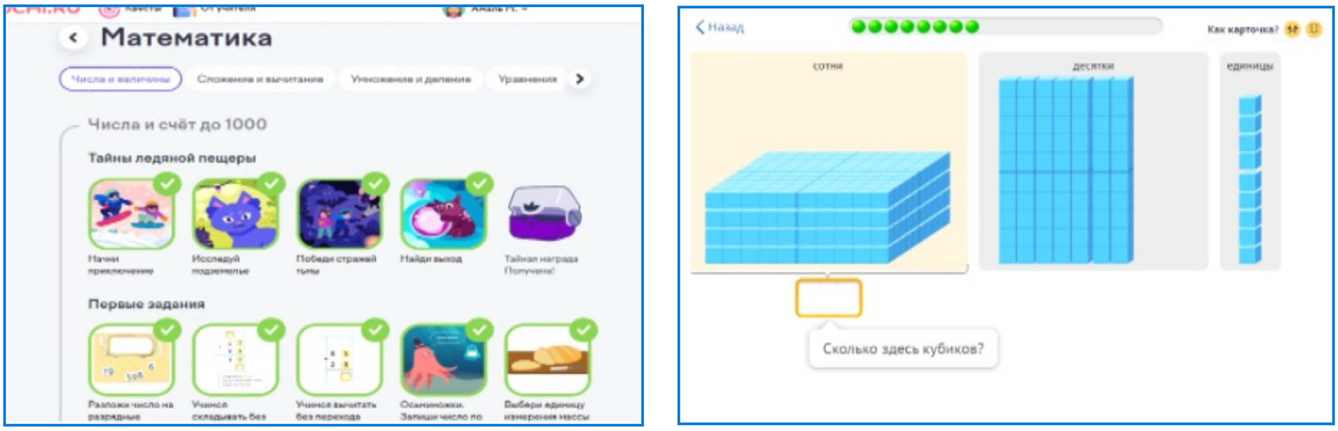
Content

The platform offers more than 150,000 interactive assignments in various school subjects for all grades, tailored to the students' knowledge level and individual characteristics [287]. Students have access to twenty free assignments for self-study every day. If a student wishes to study more, they can take out a paid subscription for one, six or twelve months [288]. The subscription gives the purchaser access to all courses on Uchi.ru, in addition to the school curriculum section. Alternatively, users can purchase a customized package that relates to the courses they need.

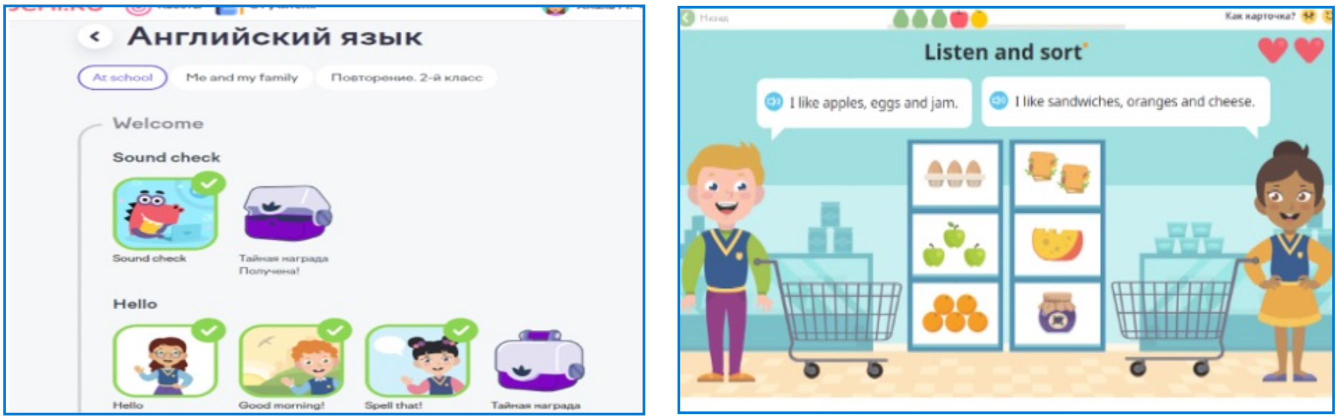
Figures 49–52 show sample lesson pages.

Features

The platform's algorithm analyzes the time a student spends on completing an assignment and the mistakes they make to create an individualized learning trajectory. This way, each student can study the course independently at a comfortable pace with the required amount of repetition and practice, regardless of their level of ability.



Figures 49 & 50. Uchi.ru: Mathematics lessons



Figures 51 & 52. Uchi.ru: English lessons

The Uchi.ru platform incorporates elements of gamification. By completing assignment cards for different school subjects, students earn points and gradually increase both their overall level and their subject-specific levels, advancing from Level 1, 'Student', to Level 6, 'Legend'. Additionally, students can participate in monthly marathons to earn points by completing cards. They can then track their position within the class and school rankings and see their class position in the overall school ranking.

During the 2022/23 academic year, the most popular course was 'Knowledge Snapshots' in mathematics and Russian language for Grade 2–9 students – it was used by more than 1.8 million students and over 108,000 teachers. During the same period, four online conferences for teachers, students and parents (caregivers) attracted a total of more than 978,000 views and 351 webinars had over 350,000 participants [289].

The platform provides support to teachers and offers conferences, professional development courses and webinars. Another valuable tool for teachers is assignments and tests with auto-grading. Each student receives a personalized set of questions. Their answers are checked automatically and the results show up immediately in the teacher's account. The teacher's account provides statistics for both the class and individual students. Parents (caregivers) can also see statistics on students' progress.

Statistics

In 2022, Uchi.ru was recognized as the most visited educational website in Russia, with 12 million students, 6 million parents (caregivers) and 800,000 teachers using the platform's products and services, according to Similarweb analytics [290]. During the early days of the pandemic, in April 2020, Uchi.ru ranked second among the most visited educational websites in the world and eleventh among all websites in Russia [291].

In the 2022/23 academic year, the most popular extracurricular course for primary school students was 'Chess,' taken by more than 13,000 students. The most popular academic subject was mathematics. Grade 1–4 students completed interactive cards in this subject 180 million times. In total, primary school students completed more than 550 million assignments in curricular and extracurricular subjects [292].

On Google Play, the Uchi.ru app has an average rating of 4.3 and over 5 million downloads, with the latest update at time of writing in April 2024. The app has approximately 39,000 reviews and is number 4 in the Top Free Educational Apps rankings [293]. On the App Store, Uchi.ru has a slightly lower average rating of 4.2 and approximately 7,000 reviews, with the latest update in April 2024 [294]. The iOS app is designed for iPhone only.

Uchi.ru has its own YouTube channel with 202,000 subscribers, more than 1,500 videos and over 16 million total views by December 2024 [295]. The most popular videos to date are Zavriki. Episode 13 'The Letter', with more than 1,185,000 views [296] and What is Uchi.ru?, a promotional video, with more than 1,183,000 views [297].

Google Trends data for 2024 indicate that Uchi.ru is predominantly used in Russia (100). Much smaller numbers of users come from Tajikistan (10), Ukraine (3), Belarus (2) and Kazakhstan (1) [298].

TAJIKISTAN: Tomaktabi.tj

Introduction

Tomaktabi.tj is a digital platform for pre-primary education launched in partnership with UNICEF in 2022. It is a Tajik version of Learning Passport, the programme developed for 5.4 million children in Europe and Central Asia, 1.5 million of whom are from Tajikistan [299], and is a great example of the initiative. The platform's Tajik name is Сандуқчаи Зулбиё, which can be roughly translated as Zulbiya Chest or Zulbiya Box – 'zulbiya' is a type of Tajik sweet pastry. The platform features seven courses, eighty-two activities, nine teacher guides and six CPD resources for teachers [300]. In 2022, Tomaktabi.tj aimed to reach approximately 890,000 children aged 3–6 within one year [301]. Consequently, the content available is exclusively suited for children of that age attending pre-school or early primary school, as well as their parents (caregivers) and pre-school and primary teachers, to accompany the children's learning.

Figures 53 and 54 show screenshots from the platform.

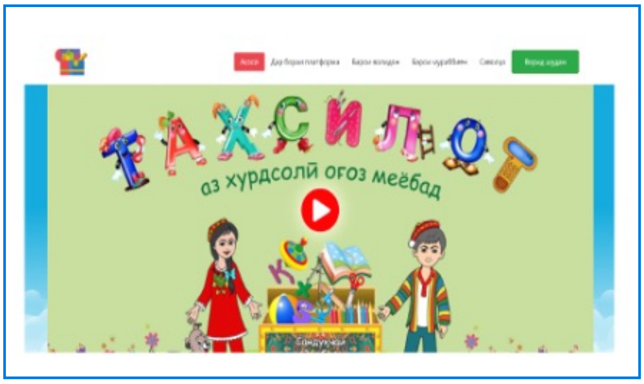


Figure 53. Tomaktabi.tj: home page

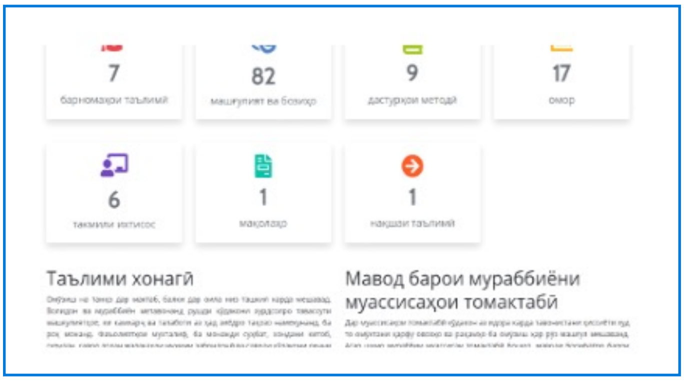


Figure 54. Tomaktabi.tj: Overview of the platform's content

Content

To access the course content, prospective users must register first by providing their phone number (see Figure 55). They receive a confirmation code, which they type into a dialogue box that appears on screen. People who are outside Tajikistan can also register, which means Tajik parents (caregivers) who are outside of the country can access the platform so their child can both learn Tajik and learn in that language. Users are also asked to provide some basic details about themselves – for example, their name, place of residence, role and level of education – before they can start using the platform.

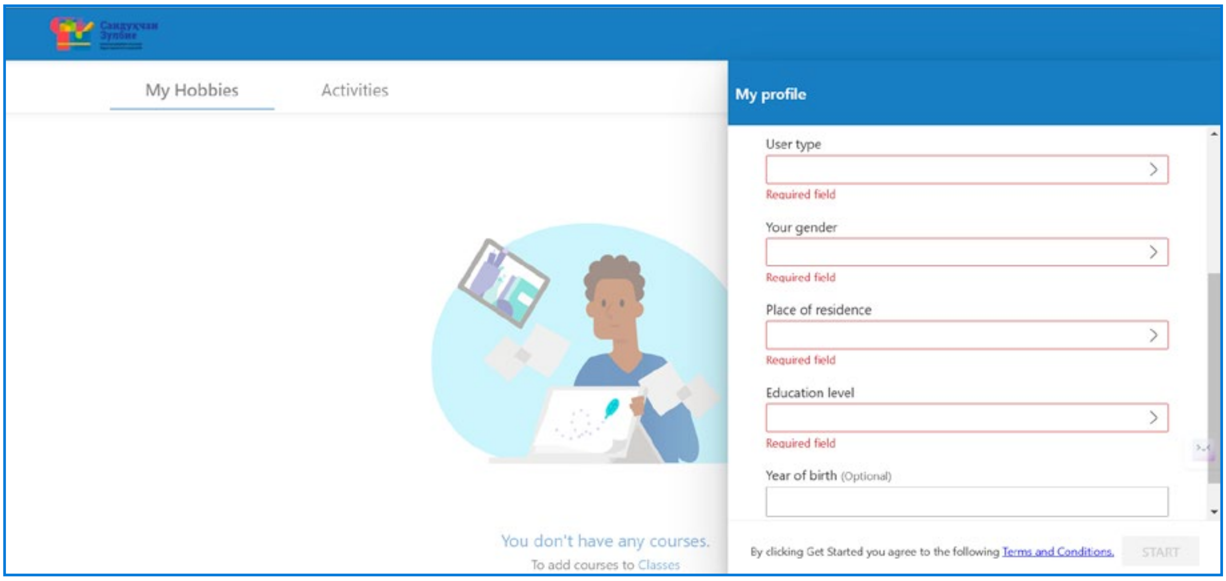


Figure 55. Tomaktabi.tj: User registration page

As of March 2025, four user roles are available: school teacher, 'coach teacher', student, parent (see Figure 56).

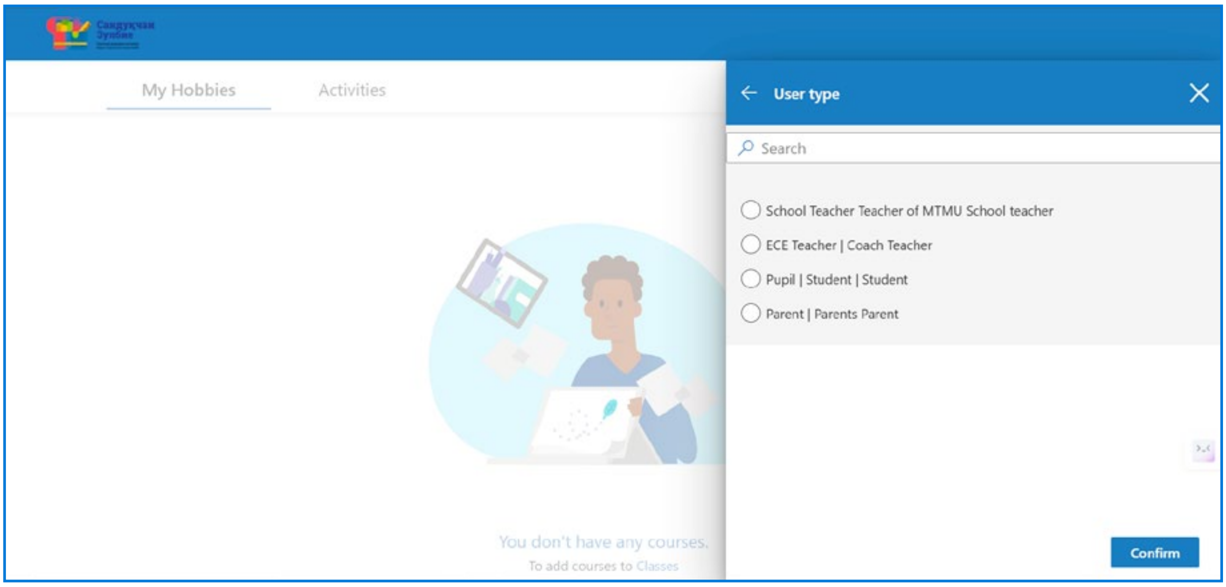


Figure 56. Tomaktabi.tj: User types

For teachers, at first glance there appear to be three courses available: 'Educational Program of Child's Development', 'Training Program of the Professional Development Course of Pre-School Institution Coaches' and 'Early Childhood Education in Tajikistan'. All three courses are essentially simply PDF text documents that users can click through. However, clicking on the rather inconspicuous 'Course Library' tab reveals many more educational programmes, teaching guidelines (called 'methodical guidelines'), CPD courses, activities and games, useful fact sheets and resources on inclusive education. Educational programmes and teaching guidelines are presented as PDF documents, and CPD courses are presented as PowerPoint-style presentations, all of which teachers can read and click through. The activities and games we analyzed were either videos (hosted on the platform itself) or picture books with some text, which teachers can scroll through.

When we changed our profile to that of a parent, the content on offer did not change, which suggests that teachers and parents (caregivers) have access to the same content.

Figures 57–60 show some sample pages from the platform. Figures 57 and 58 show content for teachers, and Figures 59 and 60 show content for children.

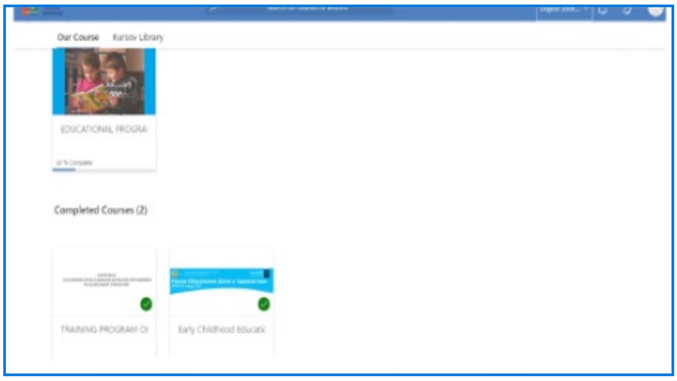


Figure 57. Tomaktabi.tj: Sample course page for teachers

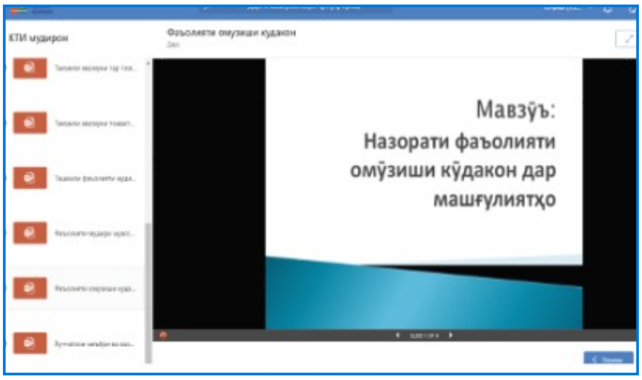


Figure 58. Tomaktabi.tj: Title page of a CPD course

Figure 59. Tomaktabi.tj: Page from a picture book

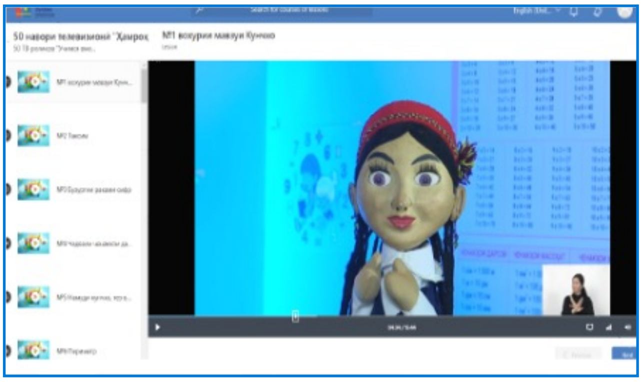


Figure 60. Tomaktabi.tj: Screenshot from an inclusive education video with sign language

Features

As mentioned above, the platform requires users to sign in. After a user chooses a course from the Course Library, they are presented with a list of topics/lessons in that course and are asked to register for the course. The registration process involves simply clicking the 'Register' button. Once they have started a course, the course is listed under the 'My Courses' tab and their progress is tracked. Users can see their certificates and their progress on their 'Activities' subpage: courses started and courses completed.

Although the platform offers three interface languages, English, Russian and Tajik, the content is available in only Tajik, with a few pieces of information or documents in Russian. The website features a search box and 'Notifications' and 'Announcements' tabs, alongside the 'My Profile' page.

The Tomaktabi.tj website does not offer accessibility features for all its content, so users must rely on their browsers' built-in accessibility features.

It does, however, contain a section devoted to inclusive education, with videos featuring sign language. Some videos in the 'Games and Activities' section also feature a sign language interpreter.

Statistics

Tomaktabi.tj is the only e-learning platform aimed at children of pre-primary age in Tajikistan. Although it has been two years since the launch of the platform, Google Trends surprisingly does not have enough data for the search term 'Tomaktabi', worldwide, in either the last 12 months or the last five years [302]. Neither 'Learning Passport' – in the context of Tajikistan – nor 'Сандуқчаи Зулбиё' (the platform's name in Tajik) yielded any results. It is therefore difficult to tell, using independent metrics, how much the platform is used by learners in Tajikistan. Some experts think that one of the problems with platforms such as this is that they require internet access, and in Tajikistan, the internet is not always available where it is needed and access is both slow and expensive [303]. Therefore, learners might be struggling to access the platform. The Speedtest Global Index 2024 showed that Tajikistan has a median mobile download speed of 6.9 Mbps, placing it 140th among 144 countries [304]. The median broadband speed is a little better – 28.89 Mbps, which places Tajikistan 129th among 181 countries [305].

As of June 2024, the Google Play link on the website was broken, and a separate search on Google Play Store did not yield any apps connected to this platform, although Learning Passport apps designed for 14 other countries were available [306]. There seems to be no iOS app for this platform either. The Tomaktabi.tj YouTube channel has only one video. It is a promotional video that was posted two years ago and has been viewed only sixty-three times [307]. The UNICEF global report on the Learning Passport programme for January–June 2023 includes Tajikistan in its list of countries and territories where the programme is live but does not contain any specifics or statistics about Tajikistan [308].

UZBEKISTAN: Maktab.uz

Introduction

Maktab.uz, launched in 2020, is the largest educational online platform in Uzbekistan for Grades 2–11 [309]. It offers users access to a vast library of video lessons and educational materials that cover the entire school curriculum. In addition, it contains numerous interactive assignments and tests and allows learners to receive feedback from experienced teachers and consultants. The platform's interface and content are available in four languages: English, Karakalpak, Russian and Uzbek. Maktab.uz was developed by the Centre for Innovations, Technology and Strategy under the Ministry of Public Education as part of the 'Implementation of Distance Learning for School Education' project thanks to a USD 150,000 grant from the Swiss Embassy in Uzbekistan [310].

Figures 61–63 show some pages from the platform.

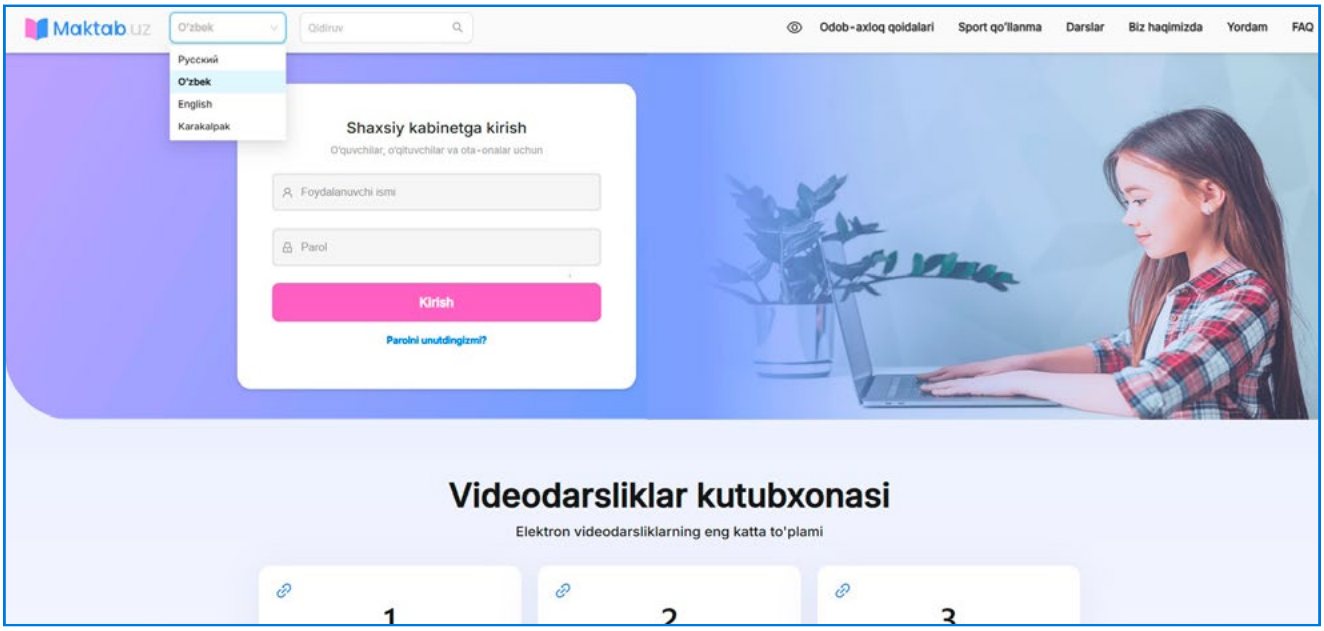


Figure 61. Maktab.uz: Home page

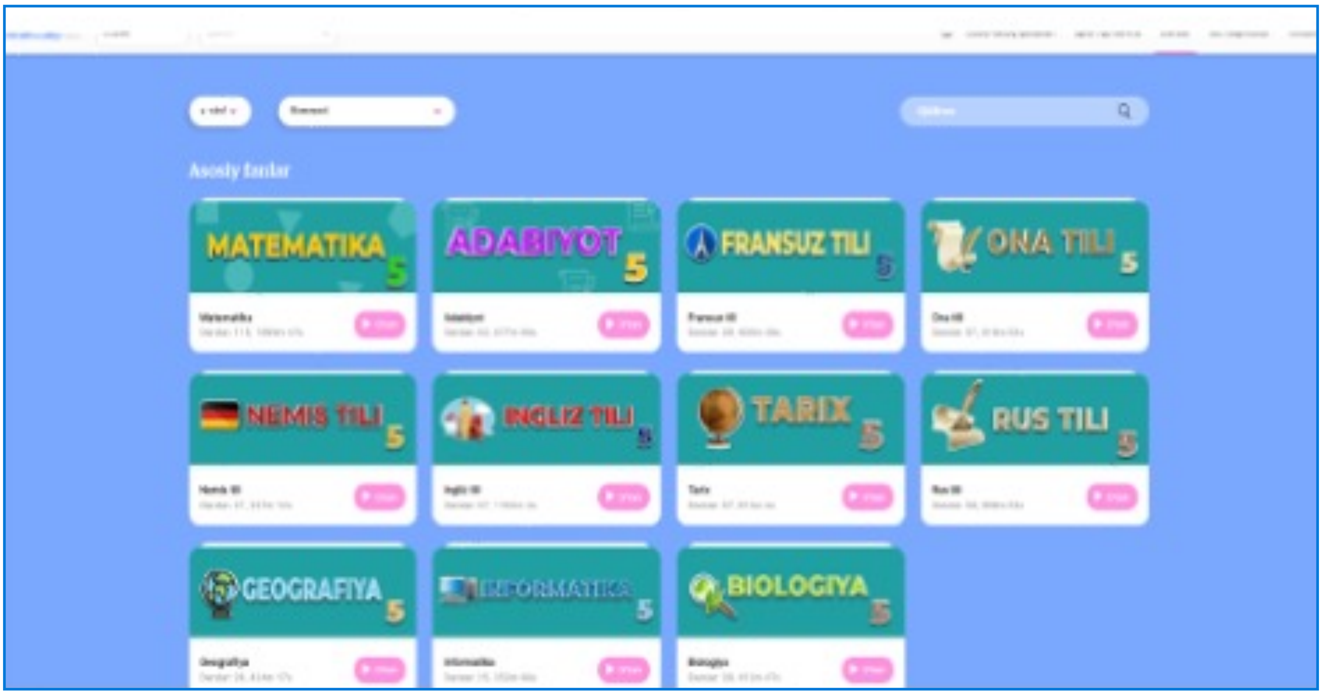


Figure 62. Maktab.uz: Curricular subjects available, Grade 5

Figure 63. Maktab.uz: Extracurricular subjects available, Grade 5

Content and features

Maktab.uz contains 7,500 video lessons for all curricular subjects for Grades 2–11 and for 67 extracurricular subjects, such as programming, graphic design, marketing, effective communication, leadership, etc. [311]. In addition to watching the video lessons, users can download presentations; there are over 2,400 presentations available on the platform. Users can choose to register, but it is not a prerequisite for using the platform [312].

The video lessons are accompanied by interactive assignments and tests, so learners can test their knowledge and receive their results immediately. Although the platform notes that all video lessons can be viewed in any of the four languages (English, Karakalpak, Russian or Uzbek), in practice some subjects are available in only one or two languages.

Figures 64–66 show some lesson pages from the platform.

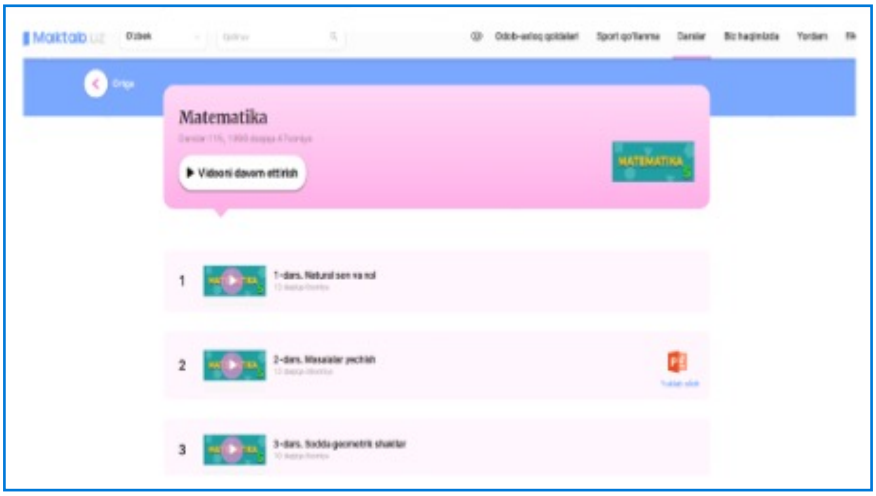


Figure 64. Maktab.uz: Mathematics lesson page

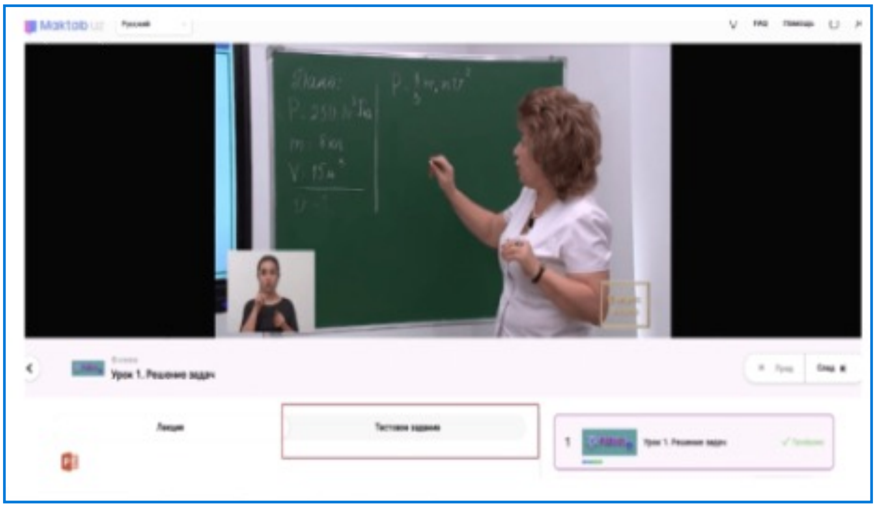


Figure 65. Maktab.uz: Physics lesson page

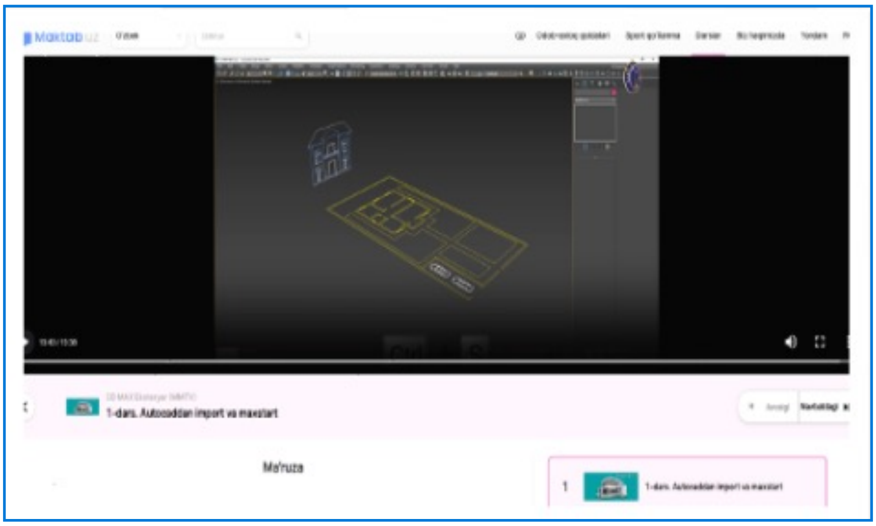


Figure 66. Maktab.uz: 3ds Max lesson (extracurricular) page

Statistics

In February 2024, the Maktab.uz website was visited over 382,000 times [313]. Google Trends data for the past five years show that Maktab.uz is used only in Uzbekistan (100). On Google Play, the app (see Figure 67) has over 10,000 downloads, with the latest update at time of writing in October 2022 [314]. The latest update on the App Store was also in October 2022. The iOS app is designed for use on iPhones and iPads [315].

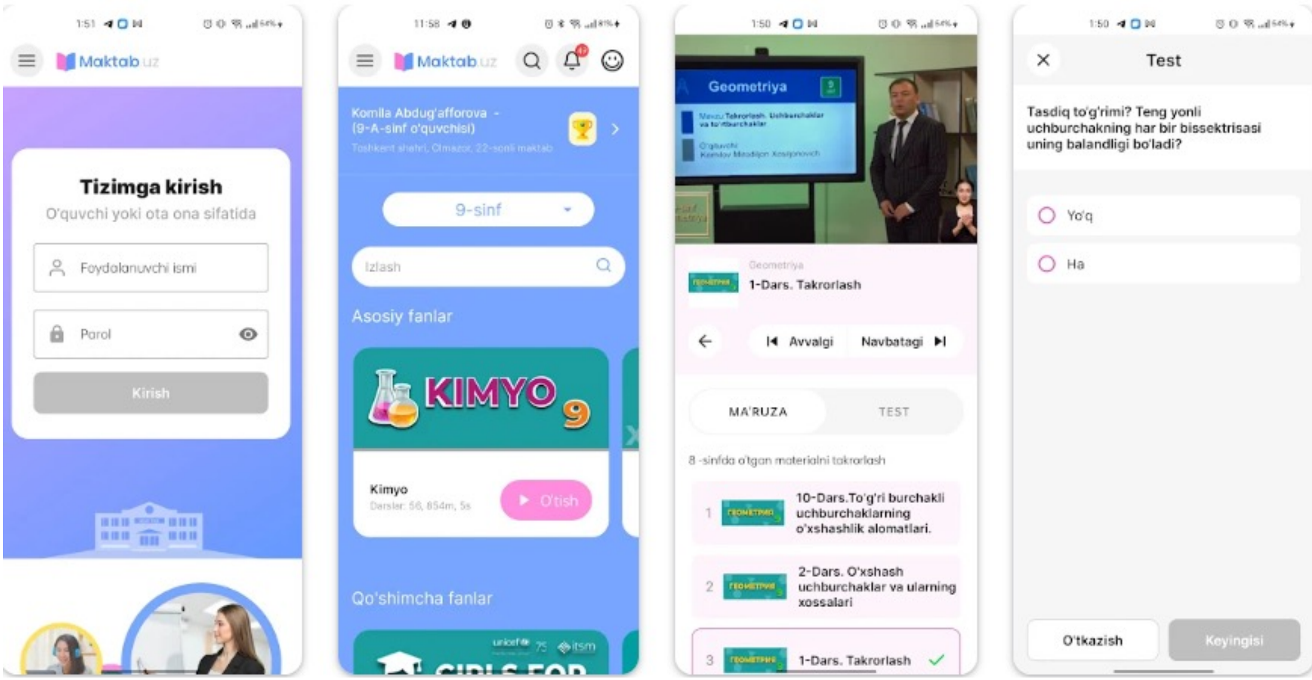


Figure 67. Maktab.UZ: Mobile app

The platform does not have its own YouTube channel. All video lessons are hosted on the platform.

CONCLUSION

Many factors can affect the ways in which ICT and AI are implemented in an education system. The historical background of a country plays a role, as it does in the case of former Soviet Union republics. When they became independent countries in 1991, they inherited a good telephone infrastructure, which facilitated their capacity for broadband connectivity thirty years later and put them in a stronger position compared to their neighbours that had similar circumstances but were not former members of the USSR. The government's approach to the creation of a nationwide learning platform can play a role – China preferred to have a state-run platform and implemented a crackdown on private companies; in India, the government and private sectors built their own large-scale solutions in parallel; and until recently Tajikistan relied primarily on initiatives funded and launched by international organizations, such as UNICEF or UNESCO.

This report shows that countries with similar ethnic, cultural and historical backgrounds can achieve very different results – for example, compare the achievements of Kazakhstan with those of its Central Asia neighbours, or compare the respective achievements of India and Pakistan. Kazakhstan achieved great results in terms of connectivity, average internet speeds, mobile data affordability and percentage of schools with internet access, and compares well to its much more powerful neighbours, such as Russia or China, both of which have immensely bigger GDPs and state budgets.

India showed very significant progress in the application of technology in education with its state-run online platform DIKSHA, which was launched only four years ago but already features content in 36 languages and has facilitated more than 5.4 billion learning sessions. Compare that to neighbouring Pakistan, where a similar platform, SABAQ, is run by a non-profit organization and has only about 5 million users – equivalent to approximately one-tenth of its entire student population – annually. While there are differences in population size and economic strength between the two countries – the population of Pakistan is approximately one-sixth of the size of the population of India [316] and its GDP in 2023 was about one-tenth that of India [317] – the comparison still stands. India seems to have done a better job of harnessing ICT for the benefit of its learners.

This report also highlights the case of China, where multiple commercial learning platforms flourished before 2021 and were valued in terms of billions of US dollars until the government crackdown. While this move might have prevented education from being commodified and might have counteracted potential undue influence from foreign investors, it also led to learners in China being unable to conveniently access educational content contributed by educators from around the country and the world. The Chinese

Government later launched three dedicated platforms for schools, TVET institutions and higher education institutions, but their uptake will take time.

Infrastructure issues – in particular, inadequate internet connectivity and access to electricity – remain significant barriers to the use of technology in education, especially in rural areas. Socio-economic factors – primarily poverty – amplify these challenges. For example, Pakistan and Tajikistan struggle with basic infrastructural needs, which significantly slows down the widespread adoption of digital educational tools.

The SCO countries are aligning with a global shift towards restricting smartphone use in schools, with most implementing nationwide bans in recent years. Some, such as China and Iran, were early adopters of such policies, potentially influencing international discussions about the issue. As debates around technology in education continue, the region's approach highlights the need to find a balance between digital integration and minimizing distractions in learning environments.

The report findings also showed a growing trend towards the adoption of AI in education. China, India and Russia are at the forefront of this trend by using AI for personalized learning, automatic grading and educational analytics. Other countries – for example, Uzbekistan – are making efforts in this direction by introducing AI tools into their educational landscape. There is also a strong emphasis on developing digital literacy from an early age – for example, in Kazakhstan, digital literacy is taught from Grade 1.

The COVID-19 pandemic and the associated lockdown clearly had a significant accelerating effect on the development and launch of both state and private online learning platforms in all SCO countries. Approaches and scales varied, but all the countries we examined swiftly developed and deployed new platforms and resources to support remote learning during school closures, albeit with varying degrees of success.

In conclusion, the state of ICT and AI in education across SCO countries is a landscape of both promise and challenge. While significant steps have been taken, much work remains to be done to ensure that all students, regardless of their location or socio-economic status, can benefit from the potential of digital education. By learning from the experiences of each country, SCO members can continue to advance towards a more inclusive and successful educational future.

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