

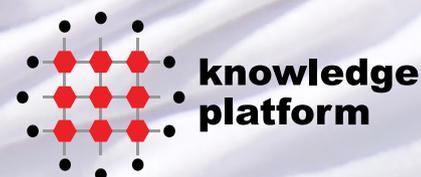
# EDUCATION TECHNOLOGY AND THE CORONAVIRUS PANDEMIC

*Pakistan's Experience and  
the Way Forward*

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*What will you learn today?*

# **Education Technology & the Coronavirus Pandemic**

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# Foreword

The coronavirus pandemic has deepened Pakistan's education crisis and the learning deficiencies in our young population. Unfortunately, but not unexpectedly, the damage wreaked by the pandemic has widened the pre-existing fault lines in our system, in which public school students, underprivileged students, girls, and young children suffer more than private school students, privileged students, boys, and youth. Alarming, our dropout rate has also increased during the pandemic.

However, the pandemic has had one silver lining, which the authors of this report describe as follows: "The coronavirus pandemic has brought education technology from the periphery to the center of education in our country."

Educators, students, and parents have quickly learned how to use education technology and have started developing best practices that promise continuous improvements for the school systems that are inclined to change. The pace of adoption of education technology and its successes during the pandemic indicates we now have an opportunity to use this medium to address the challenges of education in Pakistan.

Nevertheless, education technology is changing very rapidly, and we are in the early stages of learning how best to incorporate this medium into our education systems and practices.

Educators will only be able to effectively leverage education technology by sharing challenges and best practices and continuously learning from each other.

This report is an excellent step in this direction. We hope and expect that this report will strengthen emerging educator communities of practice around education technology and 21st century learning through which we can all grow together.

**Major General Muhammad Asghar**

Director General, Federal Government Educational Institutions

**Dr. Shehzad Jeeva**

Director, Aga Khan University Examination Board

# ▶ Executive Summary

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Prior to the coronavirus pandemic, education technology was at the periphery of education in Pakistan, used only by early adopters. The coronavirus pandemic has brought education technology from the periphery to the centre of education in our country. Many schools, educators, teachers, students, and parents have engaged with and gained confidence using a wide variety of education technology solutions, and the industry itself has grown substantially.

To learn more about this dynamic, we conducted a survey of 14,530 principals, teachers, students, and parents, and spoke with a substantial number of principals, teachers, students and parents. This report chronicles our findings and observations.

The pandemic has had a devastating impact on education in our country. Even prior to the pandemic, our education system was in extremely poor condition, except at the narrow peak of the education delivery pyramid. Over 22 million children and youth of K–12 school age are out of school. And, in the 2019 'Trends in International Mathematics and Science Study (TIMSS)' test of mathematics and science, our fourth-graders finished second from the bottom of 58 participating countries.

We believe that through the pandemic our children have suffered more than an average of one year of learning losses. These learning losses have not been uniform. Children in public schools have suffered much more than children in private schools, children from lower income backgrounds have suffered more than children from upper income backgrounds, girls have suffered more than boys, and younger children have suffered more than older children.

Despite this bleak picture, the adoption by schools, educators, teachers, students, and parents of education technology tools and practices has been quite incredible. They have used many technology platforms and adopted a wide range of learning strategies, including real-time teacher-led lessons, self-study by students, and teacher-graded assignments. Leading schools have developed best practices that include development of leadership teams, integration of technology into lesson schemes, and development and licensing of digital content and technologies.

While most innovation has been in the private sector, leading public sector institutions such as the Federal Directorate of Education and Federal Government Educational Institutions have also adopted education technology, and we have much to learn from practices developed by leading private and public sector school systems.

We believe that the momentum is now irreversible. While there will surely be stops and starts along the way, we believe that education technology is here to stay and grow in Pakistan. And it promises not only to help us address our deep education challenges, but also move us from the 20th century paradigm of uniform, test-driven education to the 21st century paradigm of individualised, critical thinking exploration.

We hope that you find our observations and infographics to be useful. If you wish to use any infographics, please download them from <http://blog.knowledgeplatform.com.pk/edtech-and-the-pandemic/>

We will be thrilled to partner with you in the journey ahead.

Yours,

**Mahboob Mahmood**  
CEO, Knowledge Platform

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# **I. SCOPE OF OUR RESEARCH**

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# Scope of Our Research

## Research Period:

June – August 2021



## Research Methods:

- ✓ Online Surveys
- ✓ Print Surveys
- ✓ Interviews



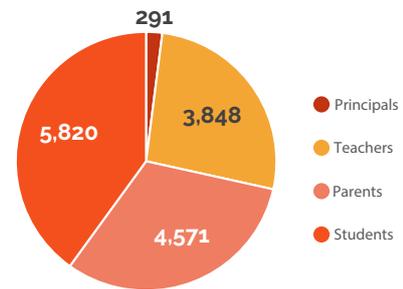
## Survey Respondents:

**14,530**

**10,103** females



**4,427** males



## Respondents by School Affiliation (Monthly Fee):



### High-cost schools

Rs. 5,000 + monthly

11,043 respondents



### Medium-cost schools

Rs. 2,500 – 5,000

1,889 respondents

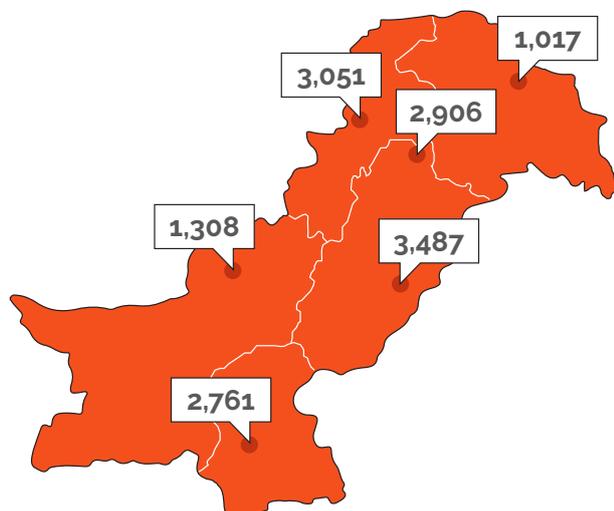


### Low-cost schools

Rs. 500 – 2,500

1,598 respondents

## Selected Schools and Networks:



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## **II. BASIC EDTECH FRAMEWORK**

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In its relatively short lifespan, education technology has bloomed many flowers.

Set out below is an infographic that identifies a basic education technology framework to help you navigate this garden of many flowers. As you read through the remainder of this report, you will come across emerging practices that will provide more substance to this framework.

# A Basic Edtech Framework

## Deployments

### In-class

Digital technologies are used in-class with teachers and students in a face-to-face environment.



### Remote

Digital technology is used online with teachers and students engaged remotely.



### Real-time Learning

"Synchronous" learning with teachers and students online and engaged at the same time.



### Split-time Learning

"Asynchronous" learning with teachers and students online and engaged at different times.

## Agency

### Teacher-led

Teachers lead the learning agenda.

### Self-study

Students decide on the learning agenda and study at their own pace.

### AI-led

An Artificial Intelligence (AI) recommendation engine leads the learning agenda.

### Group-based

A group of students study together.

## Evaluation



### Teacher Grading

Students submit assignments or otherwise engage in lessons.

Teachers evaluate performance and enter performance scores.



### Automated Grading

Students complete modules and take tests online.

The Learning Management System automatically scores performance.

One basic distinction involves how education technology is **deployed**. It may be deployed **in-class** or **remotely**.

When education technology is deployed **in-class**, the teacher usually leads the practice. **In-school** deployment is a variation of in-class deployment. For example, a school may set up a digital reading room equipped with devices that students may use to access lessons. In-class and in-school deployments enable a school to leverage equipment very effectively across student groups. Medium- and low-costs schools often rotate class sections through smart, digitally-enabled classrooms to optimise return on investment in equipment.

**Remote** deployment involves digital engagement when teachers and students are at a distance from each other. Remote learning can take many forms, but usually requires students to have a dedicated device per-student or per-family. In some cases, parents may need to be encouraged to lend their smart phones for students to take quick tests. Remote deployment may be teacher-led or may involve student self-study.

Another distinction is between **real-time (or synchronous)** and **split-time (or asynchronous)** learning.

In **real-time (or synchronous)** learning, the teachers and learners engage in-class or remotely all at the same time. When real-time learning is in-class, it is cheapest to implement because, at the most basic level, one laptop and a projector (ideally supplemented by 'clickers' for performance data capture) may serve an entire class or even an entire school. Remotely conducted real-time learning is the most expensive because it requires each child to have a device and good bandwidth connectivity.

**Split-time (or asynchronous)** learning involves teachers and students engaging with content and each other at their own pace (but ideally according to a schedule). When conducted remotely, split-time learning allows for students to share devices and make do with less-than-ideal bandwidth connectivity.

Another critical framework component is **agency**. This addresses the question of who is driving the digital learning experience. The driver could be the teacher or school system (**teacher-led learning**), the student (**self-study**), an Artificial Intelligence engine (**AI-led learning**) or a group of learners (**group-based learning**). The 20th century learning paradigm leans heavily towards teacher-led learning. The 21st century learning paradigm promotes self-study, AI-led learning and group-based learning. Later in this study, we will observe a remarkable divergence of views between teachers / principals and students / parents as to what form of learning is most effective. You will receive no bonus points for guessing that teachers / principals lean towards a 20th century learning paradigm and students / parents prefer a 21st century learning paradigm!

A fourth important distinction is between **evaluation methods**.

In the **teacher grading** method, teachers conduct evaluations of student performance. Teacher grading enables rich, nuanced responses on individual or group student outputs.

In **automated grading**, a technology system grades students, usually on multiple choice questions. Automated grading enables real time, detailed responses on student performance segmented very precisely into micro skills.

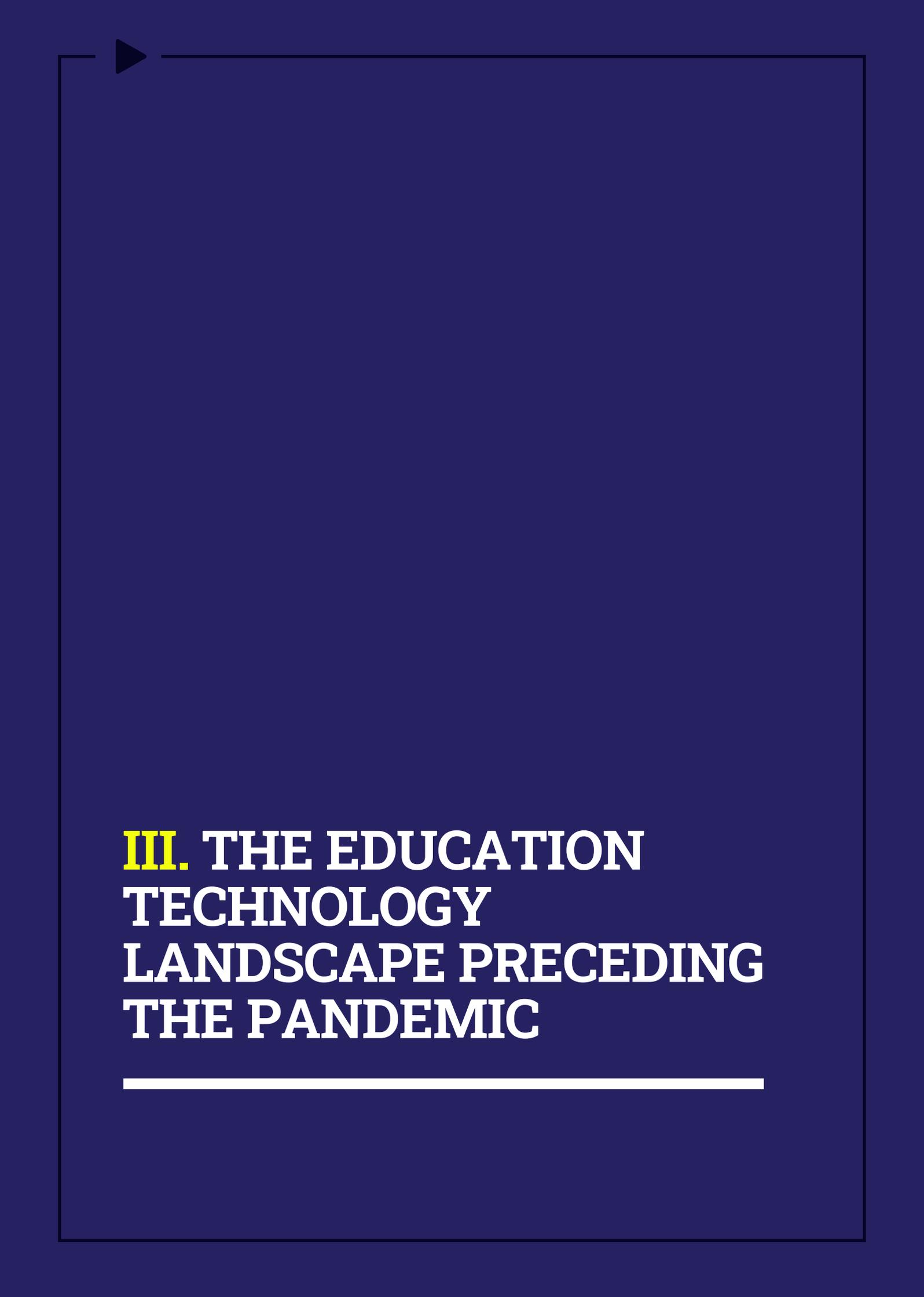
Both teacher grading and automated grading have advantages and disadvantages and both methods should be used for optimal results.

“ Technology provides great opportunities for making learning more effective for everyone with different needs. For example, students can learn at their own speed, review difficult concepts, or skip ahead if they need to. What is more, technology can provide more opportunities for struggling or disabled students. ”

Teacher

The City Nursery, Hyderabad

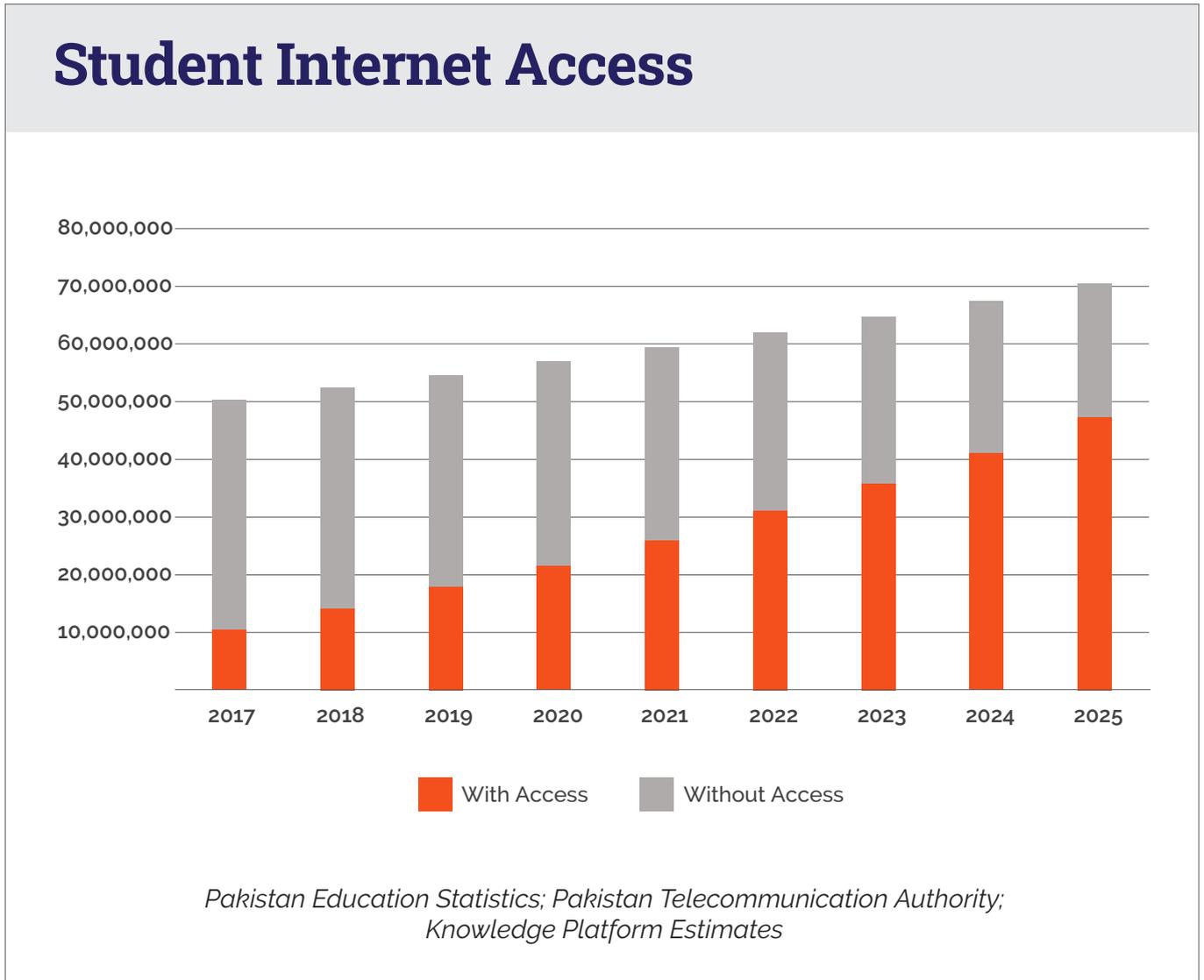




**III. THE EDUCATION  
TECHNOLOGY  
LANDSCAPE PRECEDING  
THE PANDEMIC**

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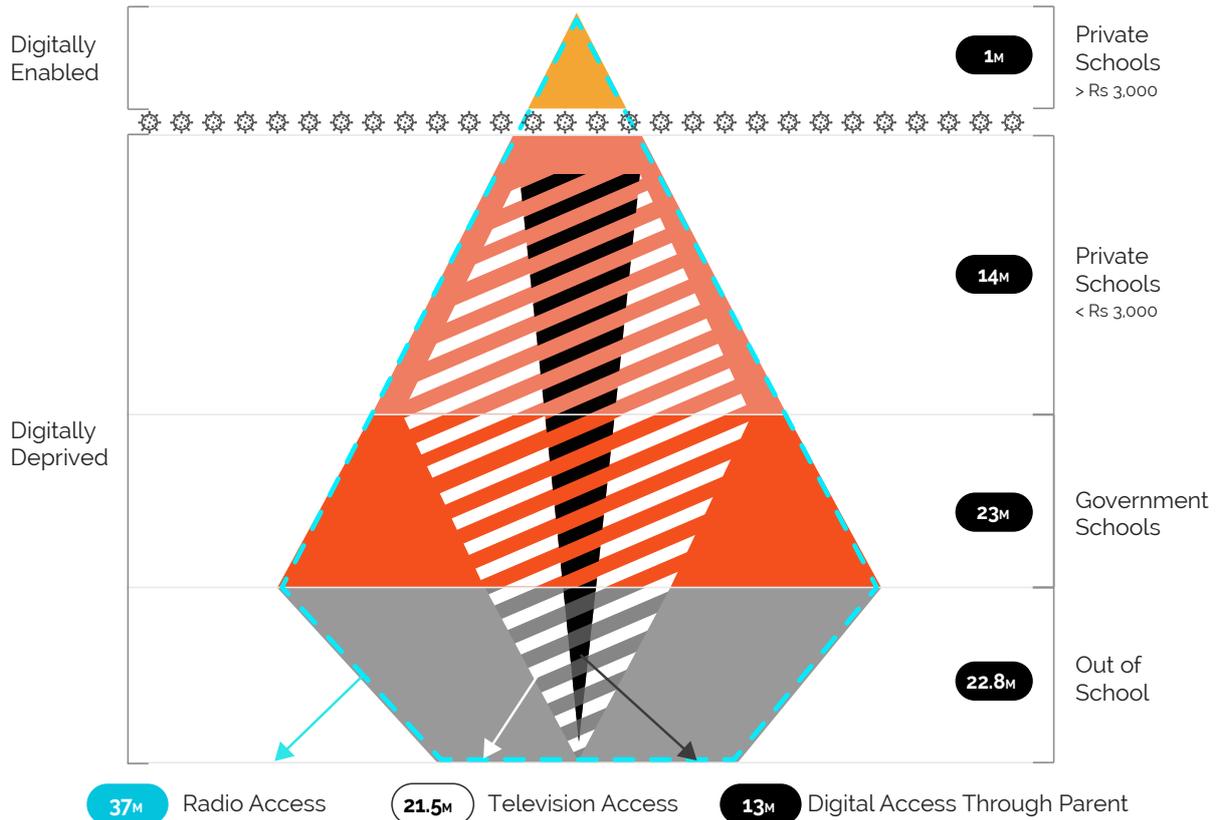
In Pakistan, access to mobile phones is growing dramatically. And, while Internet penetration rates are still quite low, over the coming four years, a substantial number of students will have Internet access at home.



Be that as it may, at present there is a severe shortage of devices and bandwidth available for schools, teachers, and students. We estimate that only about 1 million K-12 students have access to a dedicated device and regular Internet access. However, the families of over 25 million students have a smart phone and at least intermittent Internet access, which creates an opportunity for occasional Internet access by students.

By contrast, a large segment of the student population has access to radio and television. 71.9 million children in Pakistan of K-12 age have access to radio, although the use of radio is declining. More significantly, 42.2 million children in Pakistan of K-12 age have access to television, and this access is increasing.

# Pakistan's Digital & Media Education Access



*Pakistan Education Statistics; Ministry of Federal Education and Professional Training; Pakistan Broadcasting Corporation; Pakistan Telecommunication Authority; Knowledge Platform Estimates*

Prior to the coronavirus pandemic, a small private sector edtech industry had been launched in Pakistan. IIm Association, the early-stage industry's association, has about 20 members, which have collectively raised under \$20 million in equity funding. (By contrast, the Indian edtech industry has over 460 participants, which have collectively raised over \$3 billion in equity funding.)

## Members of Ilm Association

			
Ilm Association		Knowledge Platform	Sabaq Foundation
			
Children's Global Network	TeleTaleem	Storykit	FESF
			
Sabaq Muse	ISAPS	Kar Muqabla	Stemers
			
AzCorp Entertainment	Robokids	Edkasa	Taleemabad
			
Learning Pitch	Edlab Pakistan	Alif Laila Book Bus Society	Wakhra Studios
			
Goread.pk	Teach the World Foundation	Idara-e-Taleem-o-Agahi	Radec

Prior to the onset of the pandemic, a limited number of education technology companies had started offering educational programs involving either live tutors or curriculum-centric content. The use of digital content and technologies had also been introduced through "blended learning" programs in both public and private sector schools. By our estimate, prior to the pandemic, about 1 million students in the country had used education technology products with some degree of regularity.

## Leading Pre-Pandemic Private Sector Education Technology Initiatives



**GRADES**  
**PRIMARY**

- Student learning app with videos and lessons



SABAQ

**GRADES**  
**6 - 12**

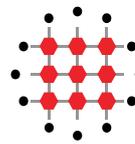
- Distribution of tutorial videos



Edkasa

**GRADES**  
**9 - 12**

- Distribution of tutorial videos
- Live streaming of lessons in remote schools



knowledge  
platform

**GRADES**  
**1 - 12**

- Blended learning platform for schools with videos, games, assessments, and reporting
- Online learning platforms and apps for students with videos, games, assessments, and reporting



**GRADES**  
**PRIMARY**

- Live streaming of lessons in remote schools



**GRADES**  
**PRIMARY**

- Student learning app with videos and lessons

## ► THE EDUCATION TECHNOLOGY LANDSCAPE PRECEDING THE PANDEMIC ─

In the public sector, the adoption of education technology for the K–12 sector had been quite limited prior to the pandemic, and mostly centred around hardware installations. These included the rollout of “IT labs” in over 4,000 public secondary schools in Punjab in 2013 – 2014 and the implementation of “smartboards” in 1,700 secondary schools in Khyber Pakhtunkhwa in 2016 – 2017. However, these projects did not include content or teacher support, and by all accounts had limited educational impact.

In the Punjab, the government took a more content-centric approach and by 2014 had launched eLearn Punjab, a website that made digital content freely available across the country. There is limited information on the success of this program, but the quality of content was considerably inferior to the quality of content offered by private sector entities.

The Jazz Smart School Program, a partnership between Knowledge Platform, Jazz Foundation, and the Federal Directorate of Education (FDE), was the most comprehensive and successful pre-pandemic blended learning program implemented in public schools.

The blended learning program included digital educational content and technology, as well as teacher training and support, and the program sponsor (Jazz Foundation) and implementation partner (Knowledge Platform) set up digital learning centres in public schools with hardware kits, including laptops, projectors, clickers, tablets, speakers, UPS, and mobile broadband.

After two years, a comparison of pre- and post-tests for this blended learning program showed a significant improvement in five key performance areas: (1) student learning outcomes; (2) teaching quality; (3) student engagement; (4) expanded use of technology; and (5) improved accountability and monitoring of results.



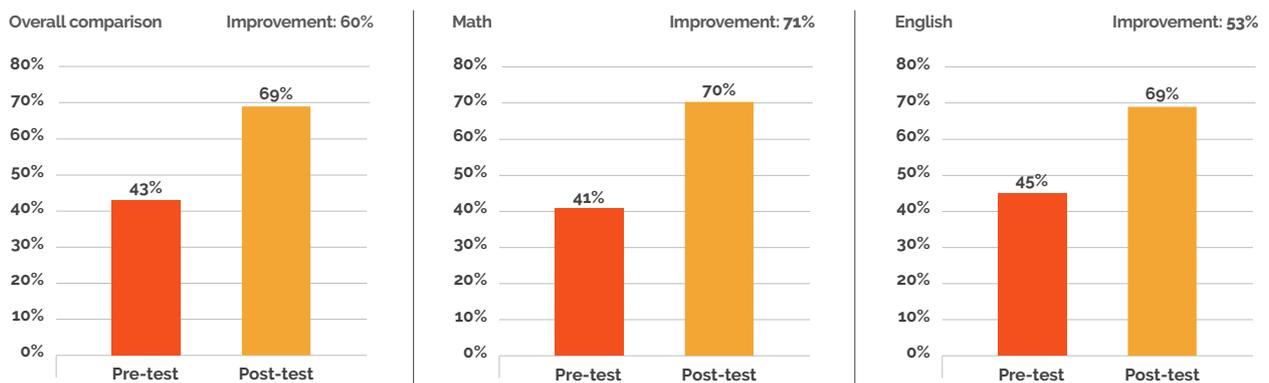
# Jazz Smart School Program



						
Period	Geography	Schools	Students	Teachers	Grades	Subjects
2017–2020	Islamabad Capital Territory	75 Girls Schools	37,000+	950+	9 <sup>th</sup> and 10 <sup>th</sup>	English and Math

## Performance Overview

This performance overview is a comparison of pre- and post-tests to determine improvement. The schools demonstrated an overall improvement of 60%. In mathematics, scores improved by 71%, and in English, scores improved by 53%.

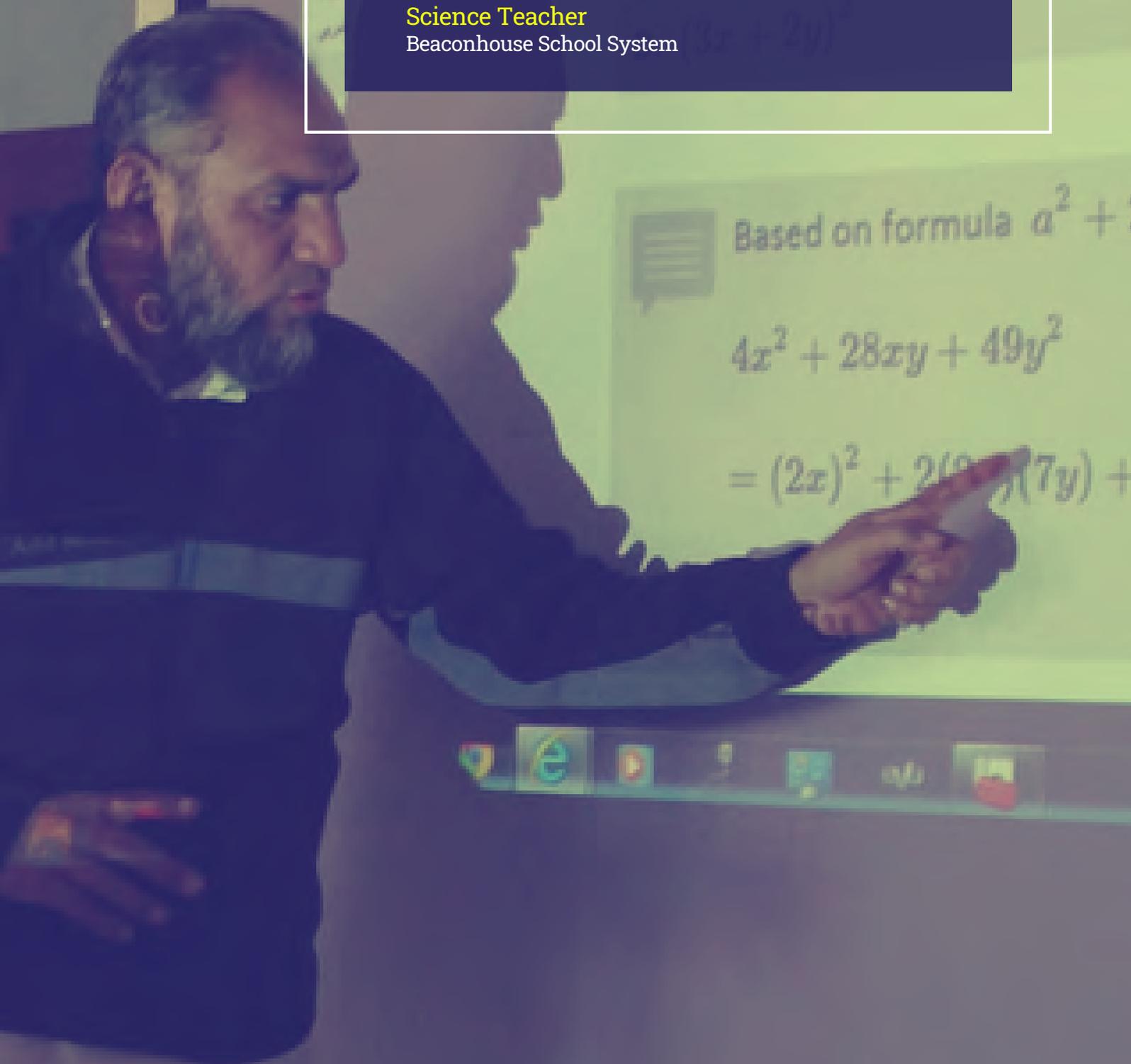


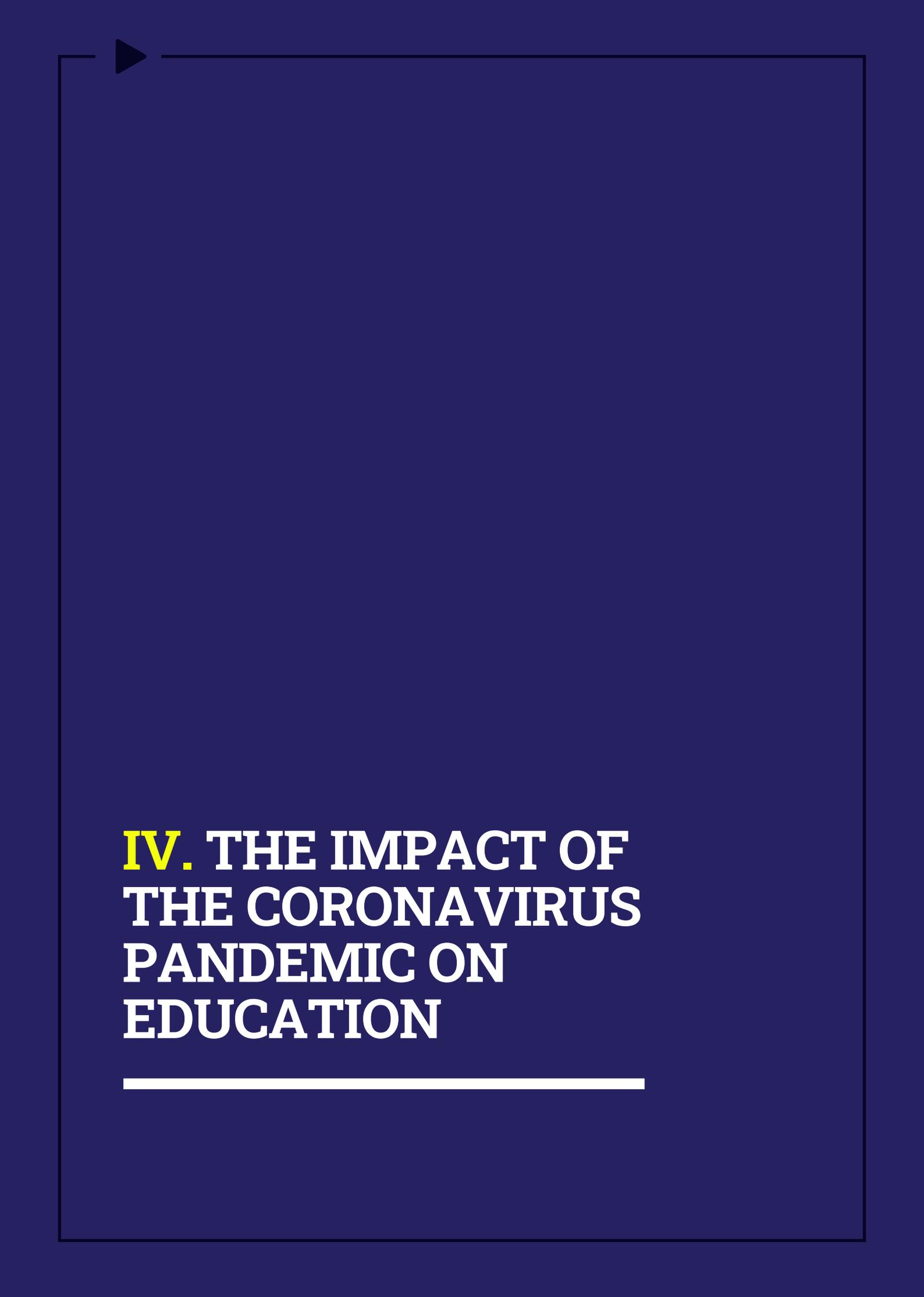
While education technology is still in the early stages of growth in the country, the coronavirus pandemic brought education technology from the periphery to the centre of K–12 education. Prior to school closures, most education technology customers consisted of 'early adopters' looking for an innovative edge. With school closures, school leaders, teachers, parents, and students started using education technology much more widely and intensively. We explore this dynamic in succeeding sections.

“ Online learning offers teachers an efficient way to deliver lessons to students. Online learning has a number of tools such as videos, PDFs, podcasts, and teachers can use all these tools as part of their lesson plans. By extending the lesson plan beyond traditional textbooks to include online resources, teachers are able to become more efficient educators. ”

**Science Teacher**

Beaconhouse School System

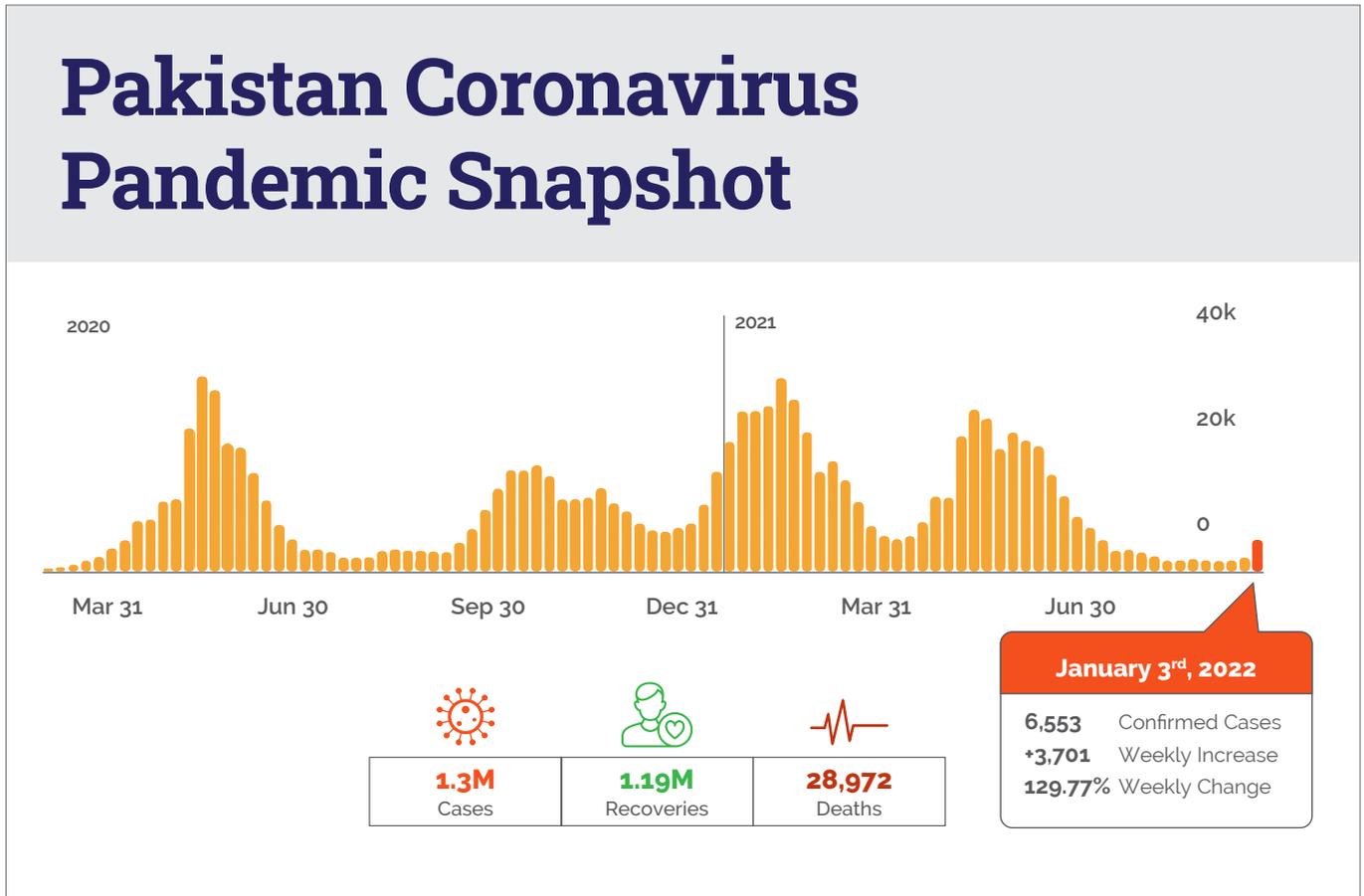




# **IV. THE IMPACT OF THE CORONAVIRUS PANDEMIC ON EDUCATION**

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While spared the worst ravages of the coronavirus pandemic, Pakistan has nevertheless been very significantly impacted by it.

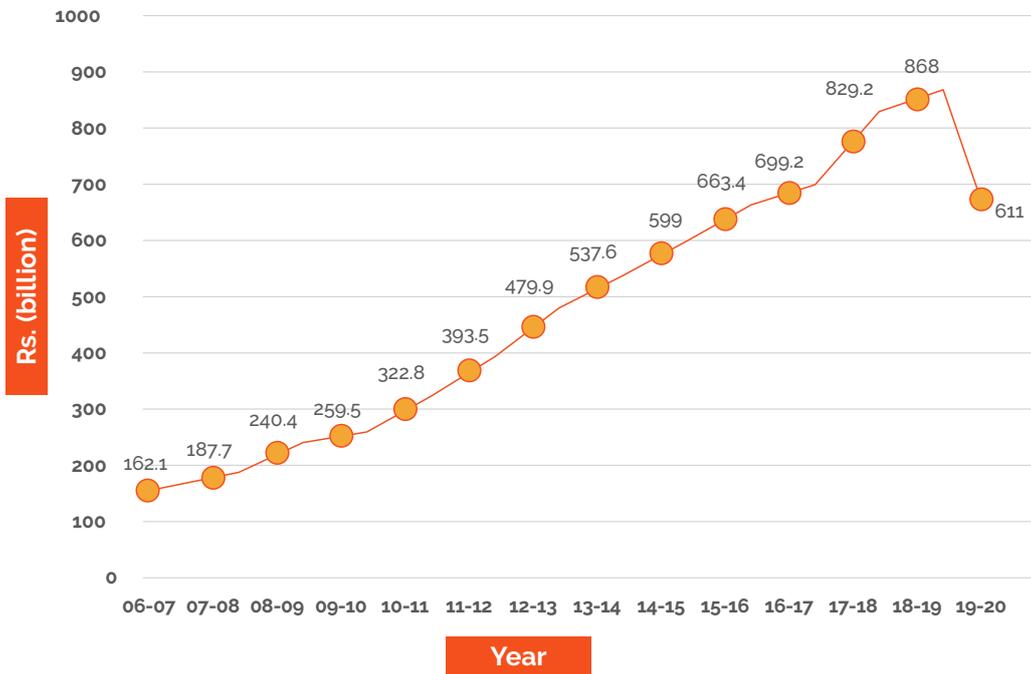


In the fiscal year ended June 30, 2020, GNI per capita shrank to \$4,522 from an already very low base of \$4,596. In the fiscal year ended June 30, 2021, GNI per capita recovered to \$5,005, but the economic recovery has been hesitant and gains until the middle of 2021 already look threatened.

At the same time, in the fiscal year ended June 30, 2020, government sector expenditure on education (including tertiary education) fell by over 29%.

GNI per capita has been measured on a purchasing power parity (PPP) basis in constant 2017 US Dollars.  
Data source: *World Bank and Pakistan Economic Survey*.

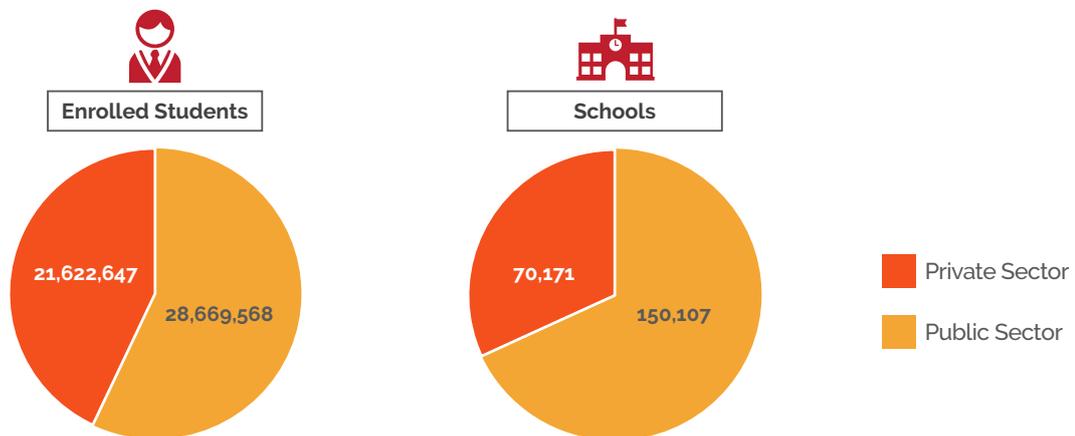
## Government Expenditure on Education



Pakistan Economic Survey, 2019

For the very large segment of Pakistan's education system in the private sector, the economic crisis of 2020 impacted the ability of parents to pay for private sector education and, as a result, the capacity of private schools to serve students. No systematic study has yet been conducted but our experience indicates that many schools (especially low-cost schools) have shut down, and an even larger number of schools are operating at reduced capacity.

## K-12 Students and Schools

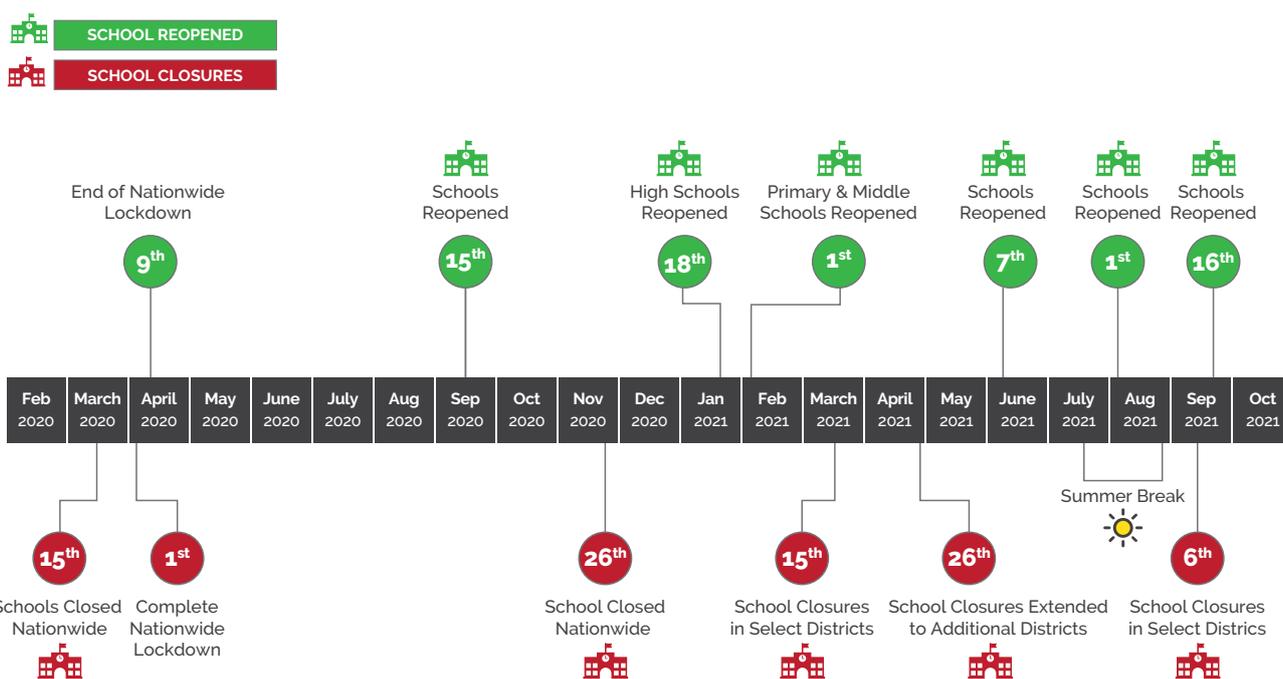


Pakistan Education Statistics 2017-2018

## ► THE IMPACT OF THE CORONAVIRUS PANDEMIC ON EDUCATION

In response to the coronavirus pandemic, schools across the country were closed in late March 2020 and, after a short reopening period in the fall of 2020, were closed again for the remainder of the year. Schools also remained largely closed through the first half of 2021. Students have been promoted on assumed performance levels or internal school evaluations. Board examinations have been postponed on several occasions and, in any event, reduced in terms of the scope of subject coverage and assessment formats.

### Punjab School Closures Due to the Pandemic

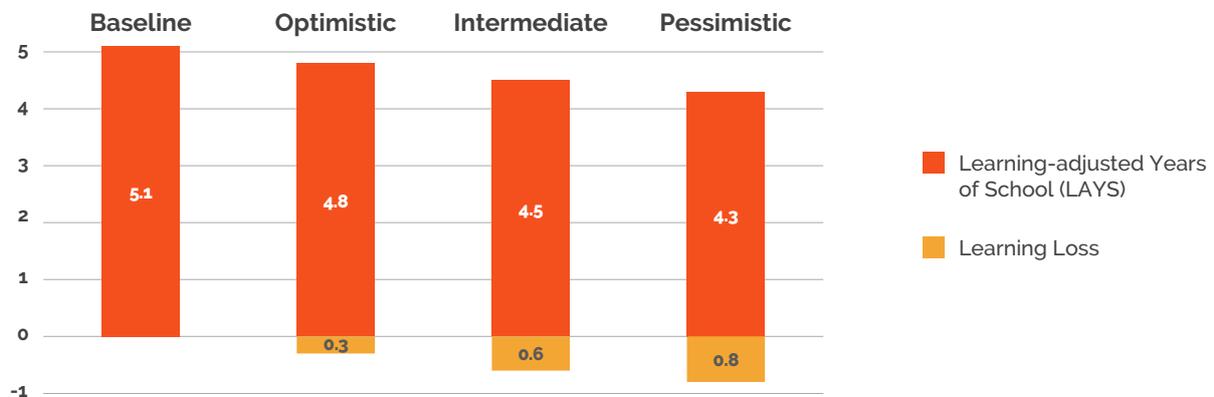


While we do not yet have definitive studies, the evidence to date supports the proposition that students in Pakistan have suffered significant 'learning losses' during the pandemic. A 'learning loss' refers to a specific or general loss of knowledge and skills or to reversals in academic progress, most commonly due to extended gaps or discontinuities in a student's education.

The World Bank calculates learning losses by subtracting from anticipated learning gains during the period of school closure less mitigation effectiveness. Based on this calculation, a report by The World Bank (Oct 2020) estimated learning losses per child in Pakistan at 0.6 years in the intermediate case and 0.8 years in the pessimistic case.

<sup>4</sup>Geven, Koen; Hasan, Amer. 2020. Learning Losses in Pakistan Due to COVID-19 School Closures : A Technical Note on Simulation Results. World Bank, Washington, DC. © World Bank. <https://openknowledge.worldbank.org/handle/10986/34659> License: CC BY 3.0 IGO.

## Learning Losses - LAYS

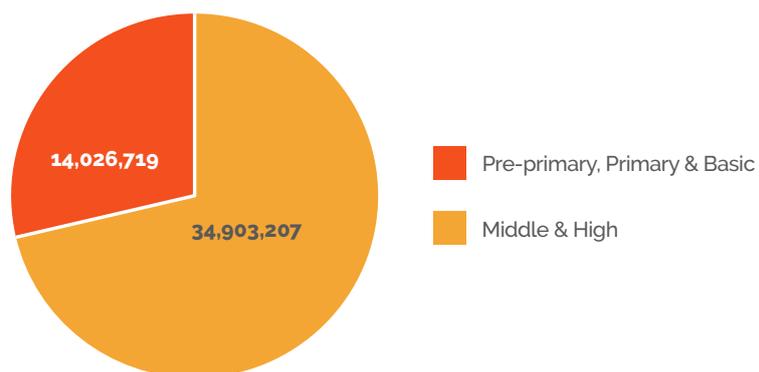


Geven, Koen; Hasan, Amer. 2020. Learning Losses in Pakistan Due to COVID-19 School Closures : A Technical Note on Simulation Results

As the report was published in October 2020, and the impact of the coronavirus pandemic has extended through most of 2021, we can assume that learning losses are in the 'pessimistic' range or greater than the estimates provided in the report.

It should also be noted that, given the country's high birth rate and the high drop-out rate in middle schools, the country's enrolled students are concentrated at the pre-primary and primary grade level on a 2.4:1 ratio in comparison with the middle and high school grade level.

## Distribution of Learners by Grade Level



Pakistan Education Statistics 2017-2018; Knowledge Platform Estimates

We believe that learning losses are amplified when a learner is in a lower grade and her or his learning is at a foundational level. If this assumption is valid, given Pakistan's high level of pre-primary and primary grade level learners, the learning losses per child are likely to be greater than estimated.

The coronavirus pandemic has disproportionately impacted the overall education population in other ways as well. The dropout rate among students has accelerated, with more boys than girls dropping out. But, overall, girls have been impacted more negatively than boys.

## ► THE IMPACT OF THE CORONAVIRUS PANDEMIC ON EDUCATION

Students in public schools have suffered more than students in private schools. Students in wealthier households and those with more highly educated mothers appear to have done better than those from less wealthy and less well-educated family backgrounds. And a small sample survey indicates that Baluchistan, Punjab, Sindh, and Khyber Pakhtunkhwa suffered progressively lower levels of learning losses.

The following is a summary of some of the key findings of preliminary studies of the impact of the coronavirus pandemic on education conducted by ASER, Centre for Global Development, Idara-e-Taleem-o-Agahi, Knowledge Platform, Tabadlab, UNICEF, and The World Bank:

### Impacts of the Pandemic on Education (I)

#### Spending & Capacity

Spending and education delivery capacity has decreased

Our observations indicate:



public and private sector spending has decreased



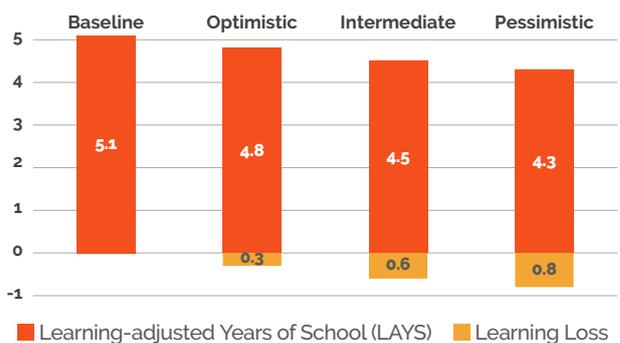
many low-cost private schools have shut down



many teachers have exited the profession

#### Learning Losses

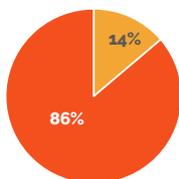
Students have likely lost an average of 0.8 learning years



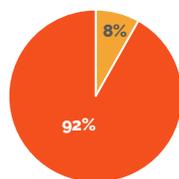
#### Younger Learners

The learning loss impact on younger students has been very severe

Grade 4 Learning Losses %



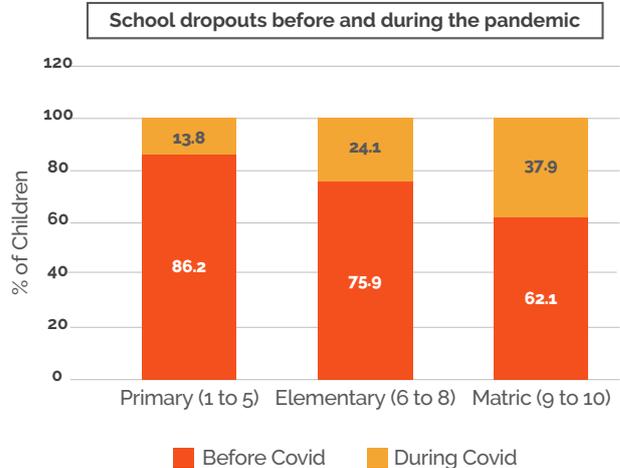
Grade 8 Learning Losses %



■ Learning loss period  
■ Target years of schooling

#### Dropout Levels

Already very high dropout levels increased by a further 4.2%

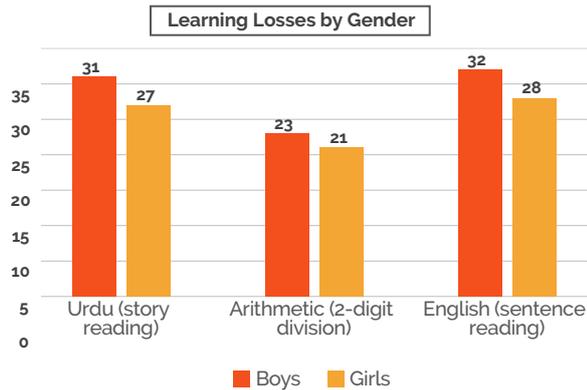


*Idara-e-Taleem-o-Agahi; The World Bank; UNICEF; Viamo; Knowledge Platform Estimates*

## Impacts of the Pandemic on Education (II)

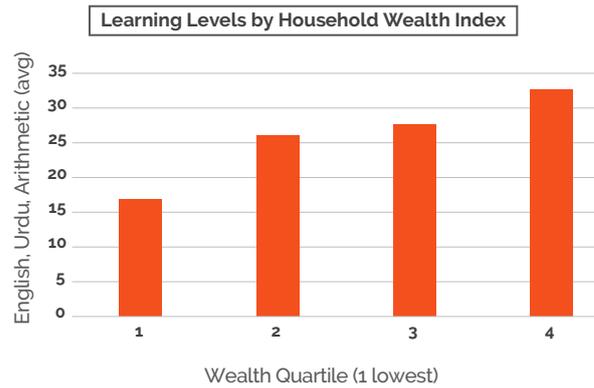
### Girls vs Boys

Girls suffered greater learning losses than boys. Students have likely lost an average of 0.8 learning years.



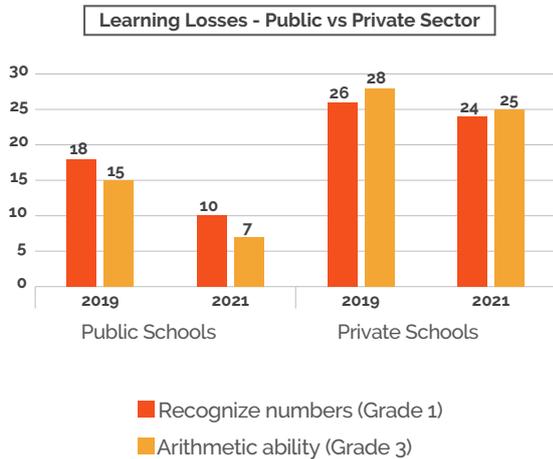
### Household Wealth

Students from wealthier families had lower levels of learning losses.



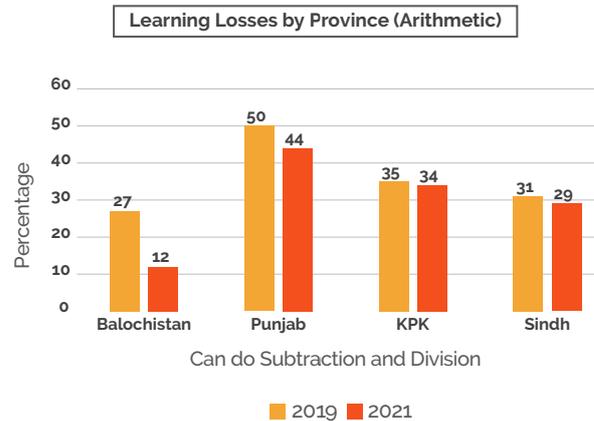
### Public vs Private Sector

Public school students had a greater decline in learning levels than private school students.



### Provincial Disparity

Learning losses were highest in surveyed districts in Balochistan, followed by Punjab, Sindh, and KPK.



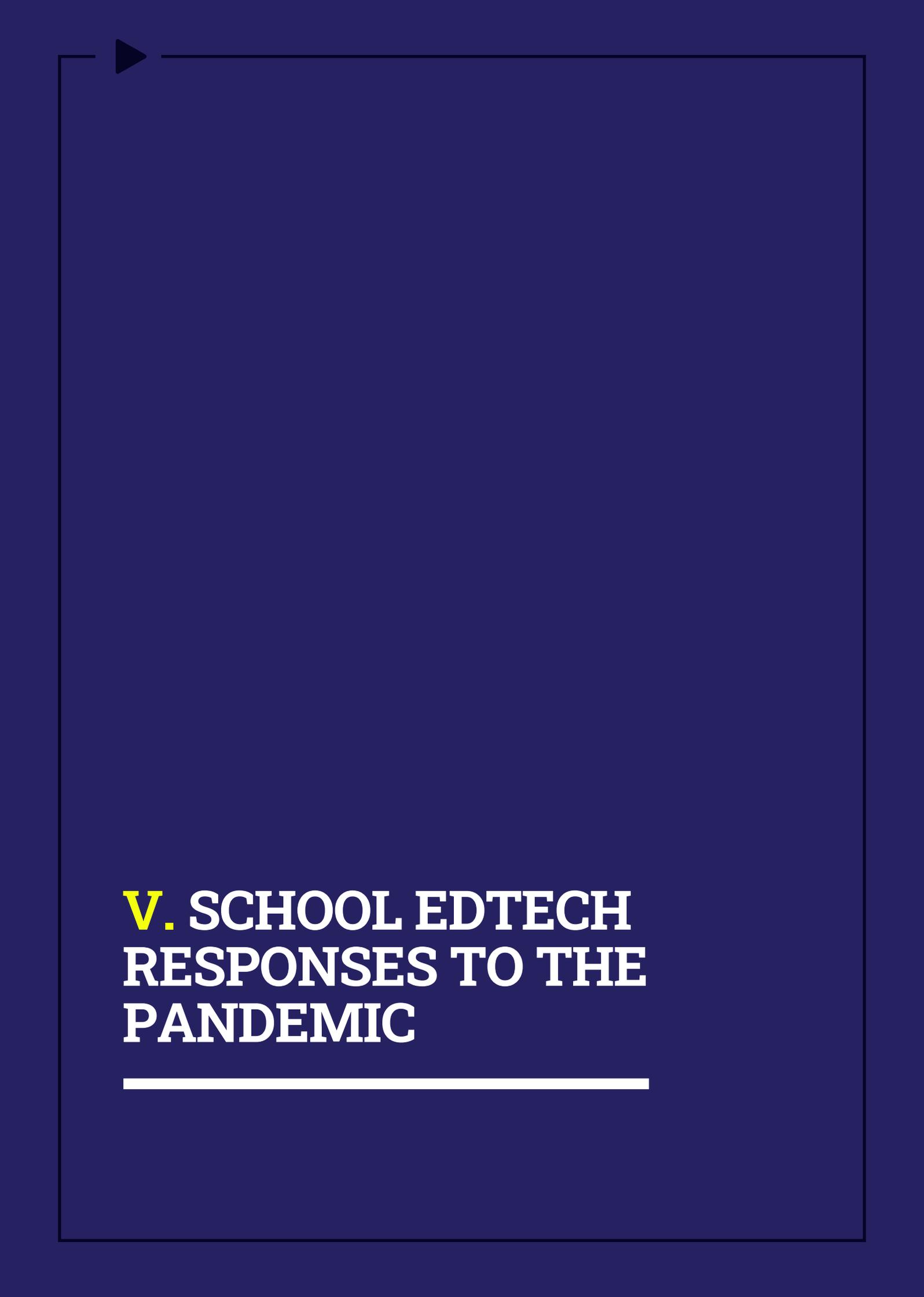
*Idara-e-Taleem-o-Aagahi; Knowledge Platform Estimates*



“ Educational technology has made me equipped with latest technologies, given me access to online games and quizzes, helped me use Google search engine for studies, watch educational videos on YouTube. ”

**Student, Grade 7**

Beaconhouse School System



**V. SCHOOL EDTECH  
RESPONSES TO THE  
PANDEMIC**

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## Pandemic Response

With the onset of the pandemic, most schools and teachers found themselves unprepared to switch to remote, digitally-driven instruction.

A very small number of schools had already implemented learning management systems, which had previously been used principally as in-school learning platforms. With students and lessons already registered on such systems, and teachers trained to deploy such systems, these schools were able to easily manage the transition to remote learning.



**Al Murtaza School Network**, a Karachi-based non-profit school, started using educational technology in 2018. Prior to the pandemic, it deployed education technology principally in-class, with a few tablets available for remedial learning in-school. After the pandemic, the school switched to remote learning. The transition was easy: teachers and students were already adept edtech users, and content had already been aligned to the school syllabus.

The vast majority of schools had limited experience with digital learning and technologies and were forced to scramble to develop coping strategies.

A very small number of private schools, mostly in the upper school fee brackets, moved decisively to adopt digital learning technologies, train their staff, acquire or develop content, and establish a remote learning regime.



**Kohinoor Grammar School**, a small school system based in Faisalabad, was one such school system, and they decided early in the pandemic to commit to digital learning. They expected all parents to make devices and bandwidth available to students.

On the other end of the spectrum, public schools generally had the weakest coping mechanism. Schools and teachers tended to be poorly equipped, and many public school students did not have the means to have regular access to devices and bandwidth. As a result, most public schools provided limited support to teachers and students during the periods when schools were shut.



**Federal Government Educational Institutions**, a large public school network run by the Pakistan Army, is a notable exception. School management developed an effective and differentiated strategy to address student populations that both had and did not have devices and bandwidth.



**Aga Khan Education Services Pakistan (AKESP)** operates over 100 schools in Pakistan for under-privileged children. In the middle of the pandemic and the cold winter of 2021, AKESP launched Knowledge Platform's in-class and remote learning education technology program for 1,600 students in 5 snow-bound schools in Gilgit-Baltistan. The program has been very impactful and is now being scaled.



# Al-Murtaza School

## From In-class to Remote Learning



### Innovation in Technology Adoption

  
Established in  
**1892**

  
Students  
**2,271**

  
Campuses  
**4**

  
Location  
**Karachi**

**2018:** AMS partnered with Knowledge Platform (KP) to introduce digital learning in classrooms



**2019:** AMS added to KP content with its own teacher content



**2020:** As AMS already had students registered and using an LMS, it quickly pivoted to pilot Knowledge Platform's Virtual Campus for online engagement

### Best Practices During School Closures

  
Adopted Virtual Campus as a central platform

  
Established IT support team in each campus

  
Trained master trainers who trained all other teachers

  
Assigned video lessons and practice exercises for math, English, science

  
Developed & uploaded videos on YouTube and shared via the homework centre

  
Conducted online exams and continued to iterate the process

  
Tracked data and developed report cards using reports feature

  
Involved parents through the student app

### Best Practices After Partial School Opening

  
Assigned online homework on Virtual Campus for repeated practice

  
In-school use of videos and practice lessons

  
Identified and emphasised struggling skills for students to catch up



# Kohinoor Grammar School: A Comprehensive and Coordinated Strategy



  
Students  
**5,500**

  
Campuses  
**5**

Est  
**1984**

  
**Faisalabad**



## SUCCESS FACTORS



Within a week of the initial lockdown, the management and IT team settled on **Google classroom**.



Junior and senior section **online leadership teams** were set up to solve problems and transmit best practices.



**Teacher training** was conducted on the use of technology and online learning.



An **online learning schedule** was established for the semester.



KGS required and achieved **100% online attendance** by their students.



**Regular school-to-parent communication** became a core part of the journey.



During school closures, **teachers came to the schools** to hold online classes.



The teachers also **shared content** through a shared drive.



Online classes involved both **synchronous learning** using Google Meet and **asynchronous learning** through assignments, videos, and quizzes.



## PERSPECTIVES



**Shahida Saigol**  
*founder of KGS*

"A major success factor was that we acted quickly and committed to getting all students online. When parents saw we were committed, they also made the commitment."



**Bushra Rasheed**  
*Principal of KGS*

"Our strategy of training teachers, establishing teacher leadership teams and ensuring in-school presence and online file sharing was very important to our success. We will keep using education technology in class as well as for homework, remedial learning and exam preparation."



**Mohsin Ali**  
*Head of IT*

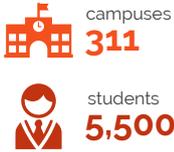
"Google Classroom worked very well but it has limits in terms of coordinated content management and reporting. We will now be adding to the use of Google Classroom through a Content and Learning Management System."



# FGEI: A Masterclass in Hybrid Education Strategies

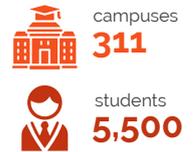


## K-10

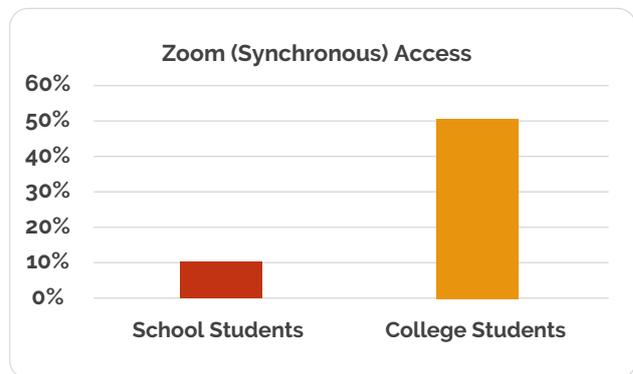
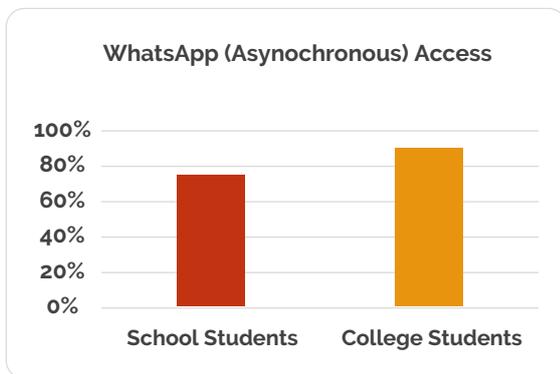


Federal Government Education Institutions (FGEI) is a K-College education system managed and subsidised by the Pakistan Army. The students are children of non-commissioned soldiers, as well as middle-class families.

## College



### Digital Access from Home



### Post-COVID Practices

### General Practices

- All students studied from home.
- All teachers worked from schools.
- Regional teacher groups formed to exchange best practices.
- Principals added to teacher groups to oversee and facilitate.

- Teacher training held on COVID-19 procedures.
- Teacher training held on online teaching practices.
- Telephone contacts established between teachers and parents / students.
- "Chain" process set up so students with digital access contacted students without digital access.

### Students with Digital Access

### Students without Digital Access

- High-speed Internet made available to teachers.
- Videos made available through Google Drive and WhatsApp.
- Videos supplemented by limited live (synchronous) teaching sessions.

- Printed homework and worksheets made available.
- School gate facility established to make materials available.
- Students visited schools once or twice a week.



# Aga Khan Education Services Pakistan

## Edtech in a remote setting



AKES Pakistan launched Knowledge Platform's digital learning platform in February 2021 in five remote schools in Gilgit-Baltistan for over 1,600 students. The system was deployed offline on school premises and online for self and remedial learning. The students both travelled to school and used the online system and achieved excellent results.



- Aga Khan Higher Secondary School, Gilgit
- Aga Khan Higher Secondary School, Gahkuch
- Aga Khan Higher Secondary School, Hunza
- Aga Khan Higher Secondary School, Sherqilla
- Diamond Jubilee Model High School, Danyore



1,675  
Total Students



51%  
49%

Grades Students

Middle	471
SSC	687
HSSC	517



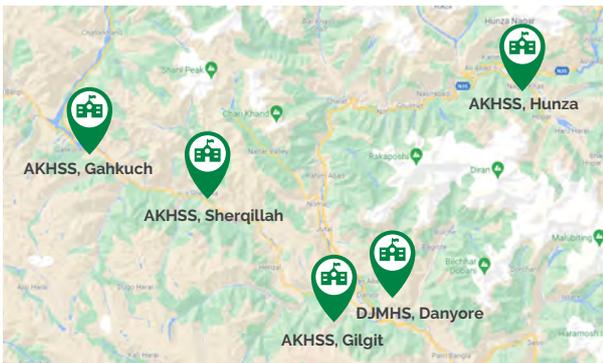
78  
Teachers trained



5  
Principals trained



### SCHOOLS IN GILGIT-BALTISTAN



### PERSPECTIVES



**Aleena Zaman**

(SSC) AKHSS, Gahkuch

"Knowledge Platform has been very helpful during the challenging times of COVID-19 as well as in preparing for the annual examination 2021. We could easily assess our knowledge and skills and understand where to improve. The best part is that all content comes from AKU-EB. I am very satisfied with my performance and look towards achieving more. In the future I want to pursue Computer Sciences."

#### Time spent

Hours Spent Overall  
**187,795**

Hours Spent per student (Average)  
**113**

#### Grades 6–8



Social Studies



English



Mathematics



Science

#### Grades 9–12



Biology



Chemistry



Physics



English



Mathematics



Pakistan Studies



Urdu



Islamiyat



Questions attempted  
**1,063,265**



Assessments taken  
**86,403**



Content Modules (Videos)  
**47,250**



Offline assessments count  
**27,415**



Online assessments count  
**58,988**

Both federal and provincial government education departments did attempt to address the learning gap opened by the pandemic through radio, television, and internet programs for educational content. However, the comprehensiveness and quality of these programs was variable, and we have limited data to measure impact and utilisation levels of these programs.

# Public Sector Radio, TV and Digital Education Programs



## Radio School

Educational radio programme broadcasting on Radio Pakistan for 4 hours daily, by MoFEPT and the Ministry of Information and Broadcasting



## TeleSchool (Nationwide)

MoFEPT, UNICEF, EdTech Partners: Educational TV program broadcast of digital lessons for grades 1 – 12

## Taleem Ghar (Punjab)

Punjab School Education Department (SED): Educational TV program broadcast of digital lessons for grades 1 – 10



## eLearn Punjab (Punjab)

Website/ mobile application with digitised textbooks, video lectures, and interactive assessments for grades 1 - 12, by SED and PITB

## KP Learning Portal

Website for digital learning, with over 500 animated video lessons in Urdu and Pashto languages for grades 1 – 8, by KPESED

## KP Online Teacher Training Certification

Online platform for teacher training certification for most subjects, by KPESED in collaboration with American Board Teaching Certification

## KP Virtual Teacher

Website/ mobile application for students and parents to gain knowledge of key concepts for sciences and mathematics, by KPESED

## KP Standardised Homework Assignments

Online standardised homework assignments for all grade levels, by KPESED with UNICEF and PITE

## Sindh Digital Learning Platform

Website for digital learning, with animated video lessons and practice tests for all subjects for grades 6 – 12, by SELD

## SELD Learning Application

Mobile application for primary grades video lessons in English, Urdu, and Sindhi languages, by SELD with UNICEF and Microsoft

## E-Learn - Sindh Education Foundation

Website for story-based animated videos for primary grades in Urdu and Sindhi languages, by SEF

## Teacher Training – Sindh Education Foundation

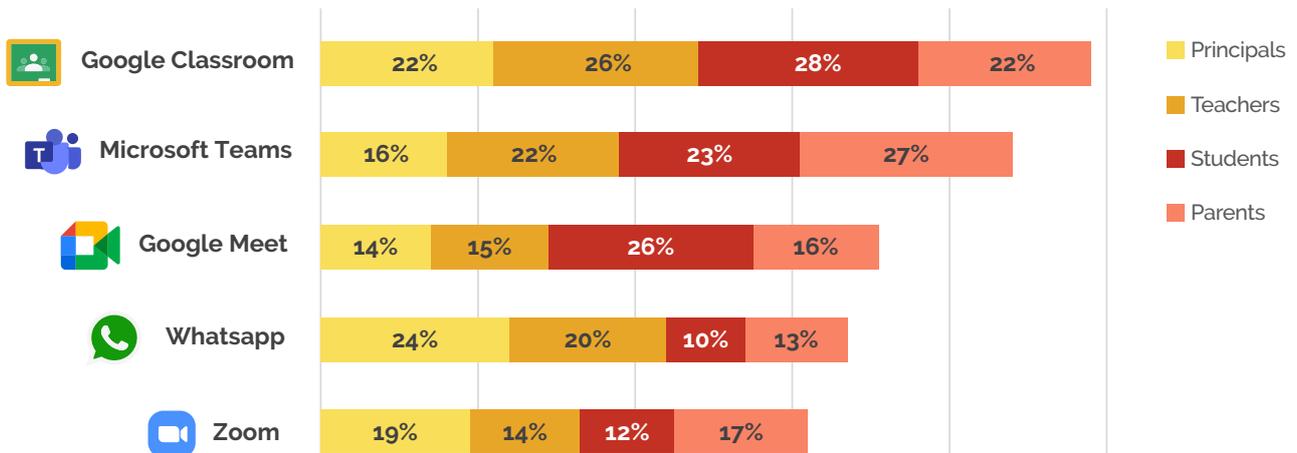
Teacher training sessions for Microsoft Teams, ECCE National Curriculum, and creating digital lessons, by SEF



## Technology Preferences and Challenges

In Pakistan, schools and teachers responded to the pandemic with whatever devices and applications they had at hand. WhatsApp became an early favourite application for teachers to communicate with parents and students. Over time, schools and teachers began to adopt and develop preferences for other applications, with most schools relying on applications that did not charge sign-up or usage fees.

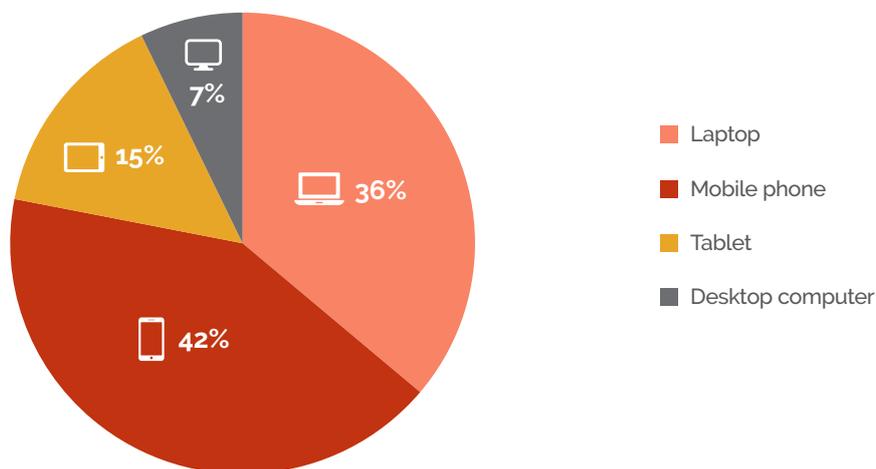
### Most Popular Digital Applications



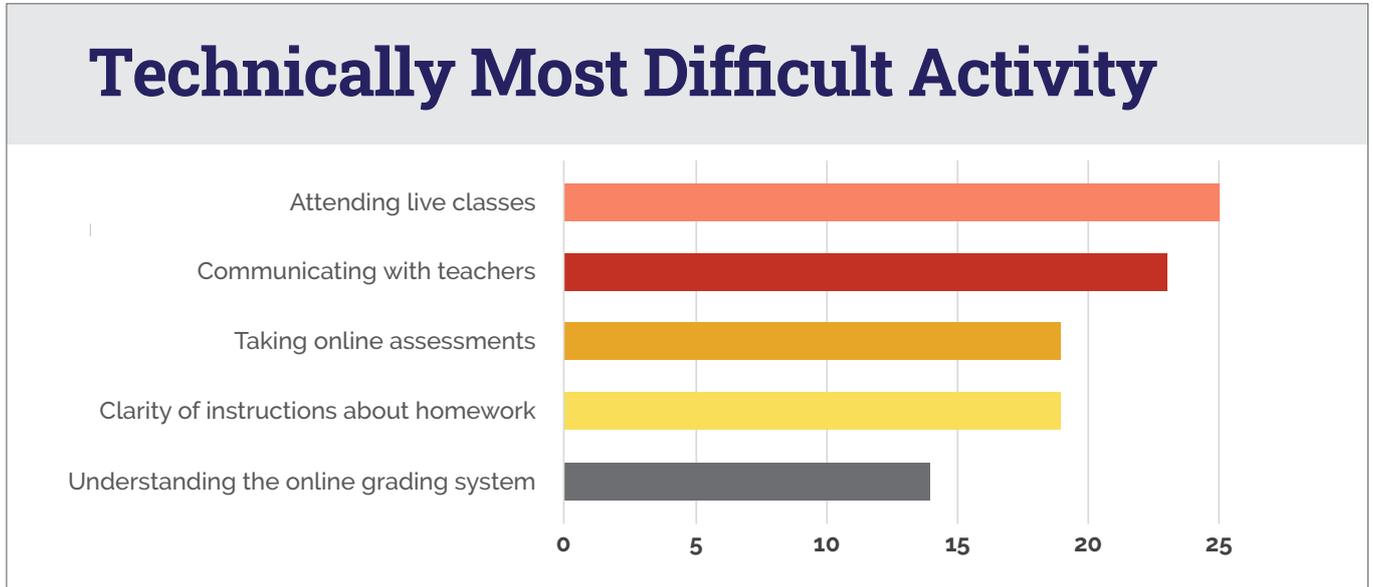
Students most often used mobile phones and laptops to attend online classes. It is important to note that most of these devices were shared, either between siblings, or between children and parents. This meant that most students did not have continued access to these devices and could only use them for a limited period.

A major lesson we may derive from this experience is that governments could consider providing incentives for making devices available for education.

### Devices Most Used by Students

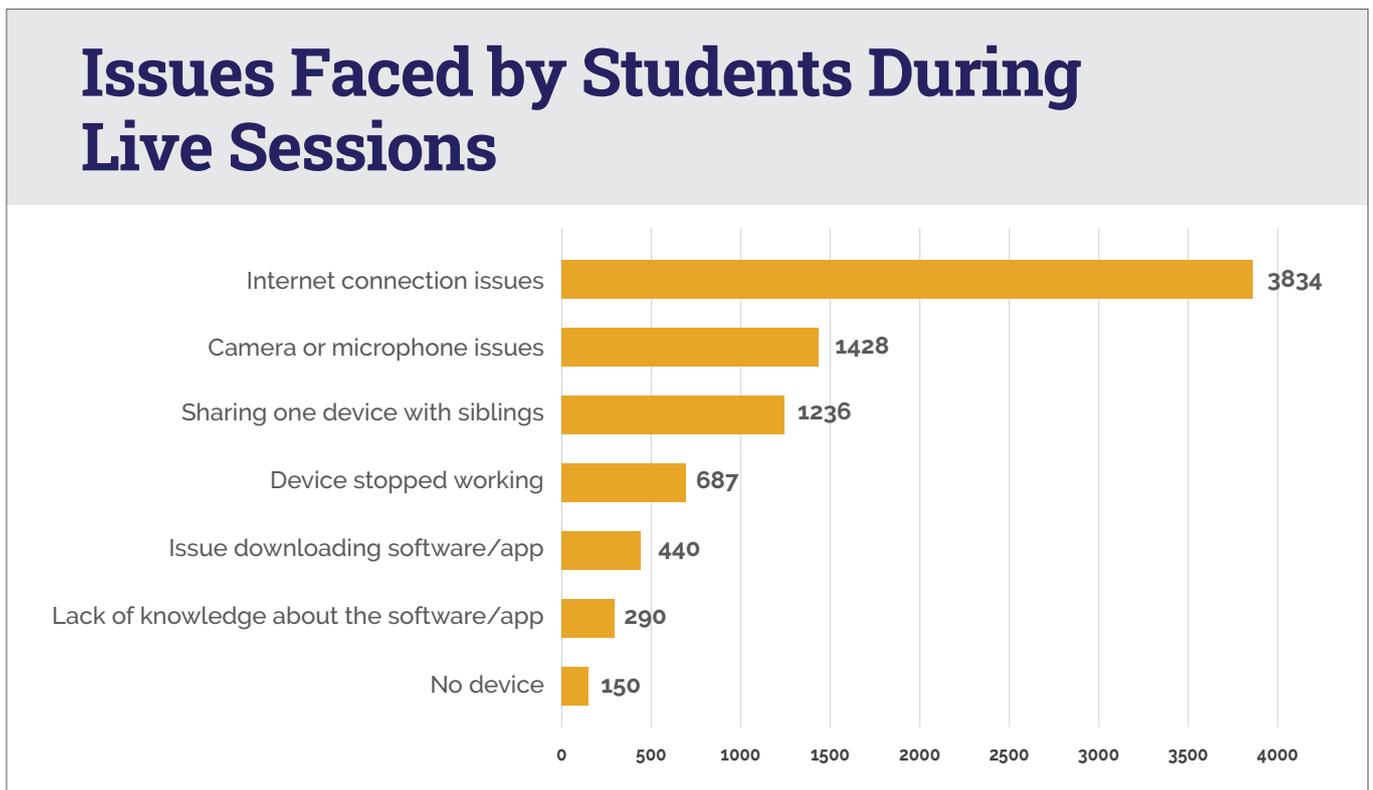


Prior to the onset of the pandemic, a limited number of education technology companies had started offering educational programs involving either live tutors or curriculum-centric content. The use of digital content and technologies had also been introduced through 'blended learning' programs in both public and private sector schools. By our estimate, prior to the pandemic, about 1 million students in the country had availed education technology products with some degree of regularity.



In synchronous, teacher-led, live learning sessions, a strong and stable internet connection was cited as the biggest problem by far.

A major lesson we may derive from this experience is that governments could consider subsidising or otherwise making available low-cost internet connectivity for education.



## Learning Engagement Preferences and Challenges

In trying to determine preferred modes of learning engagement, we focused on three principal modes:

- **Real-time (synchronous) teacher-led lessons.** This mode of engagement was used very extensively by teachers, and it basically mimicked in digital mode the standard form of teacher-led engagement in schools.
- **Split-time (asynchronous) teacher-graded assignments.** In this mode of engagement, teachers provided assignments to students (in some cases involving paper-based homework which was photographed and transmitted and in other cases involving submissions of homework using digital tools such as Google Docs), which were then graded by teachers.
- **Split-time (asynchronous) student self-study.** In this mode of engagement, students studied on their own time, and used a wide variety of videos, games, activities, and assessments. The study program was typically overseen by teachers but often also involved parents.

We found a very wide gap between the perceptions of teachers and principals (on the one hand) and students and parents (on the other hand) of the preferred and most effective modes of engagement. Teachers and principals opted strongly for real-time (synchronous) teacher-led lessons. By contrast, students and parents even more emphatically preferred split-time (asynchronous) student self-study.

We believe that this reflects a divide in the pace at which 21st century learning assumptions are being adopted by students and teachers. Students want to be the agents of their own learning and prefer self-study, AI-based learning, and group-based learning. Teachers are more firmly embedded in the 20th century learning paradigm in which they transmit knowledge to students through whole-class lectures.

One may say that, during the pandemic, teachers developed mastery of new ways of communication but remained more fully in their prior pedagogic paradigm, while students developed mastery of new ways of communication and embraced more fully a new paradigm of student-centric learning.

The perceptions of parents are also very meaningful. Real-time (synchronous) teacher-led lessons leaves no room for parental engagement: teachers conduct class, students attend class, and parents are on the sidelines. However, both split-time (asynchronous) teacher-graded assignments and split-time (asynchronous) student self-study provides room for parents to engage with their children and participate meaningfully in the learning process.



## Preferred Mode of Online Engagement

When evaluating the preferred medium of online instruction, there is a vast gap between teacher and principal preferences (on the one hand) and student and parent preferences (on the other hand).



**74%** of students  
prefer self-study

"We can have a better learning platform with different games, quizzes, videos, and much more, which make learning fun and easy."

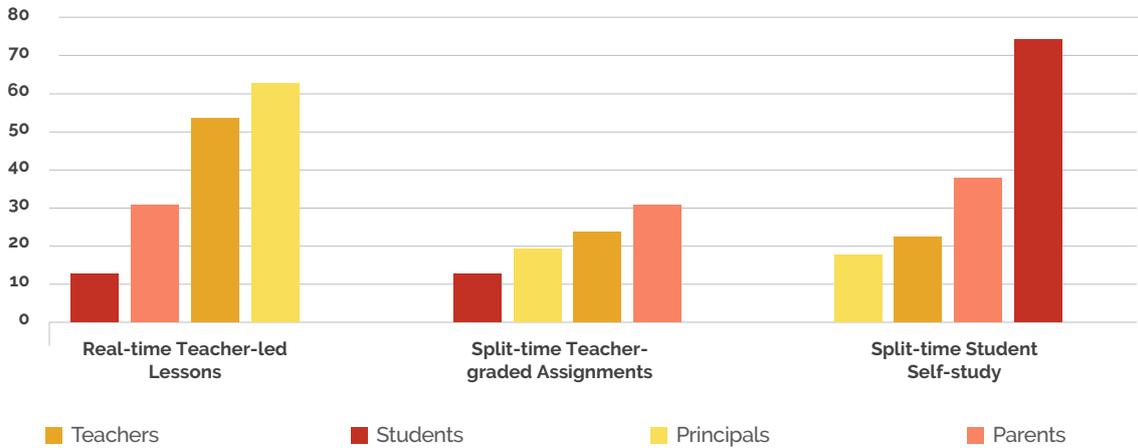
Student, The City School



**54%** of teachers  
prefer live sessions

"Live lectures and quizzes have helped students more than other methods. This is because they were given the option to ask their queries on the spot."

Teacher, The Smart School



### Best Practices in Blending Teacher-led Live Learning and Student Self-study



#### Teacher-led Live Learning

- Orientation and planning
- Introducing new topics
- Remedial learning for struggling skills
- Student presentations and group discussions

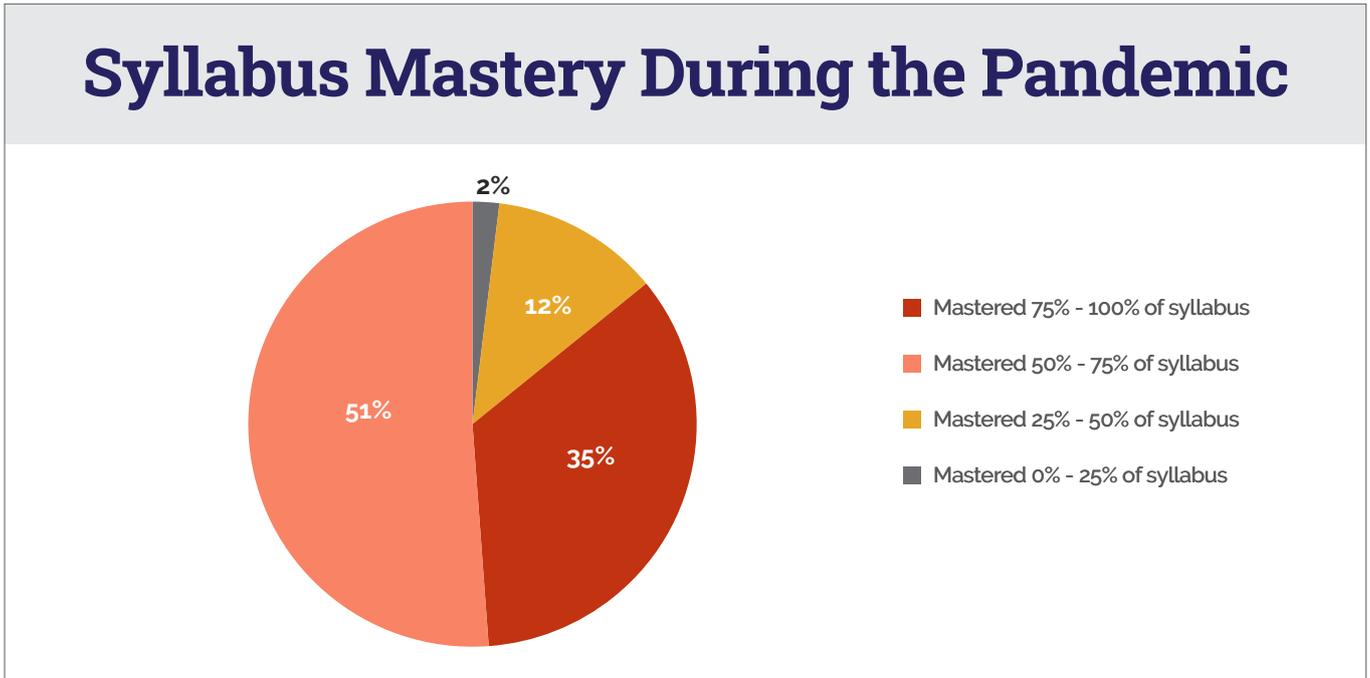


#### Student Self-study

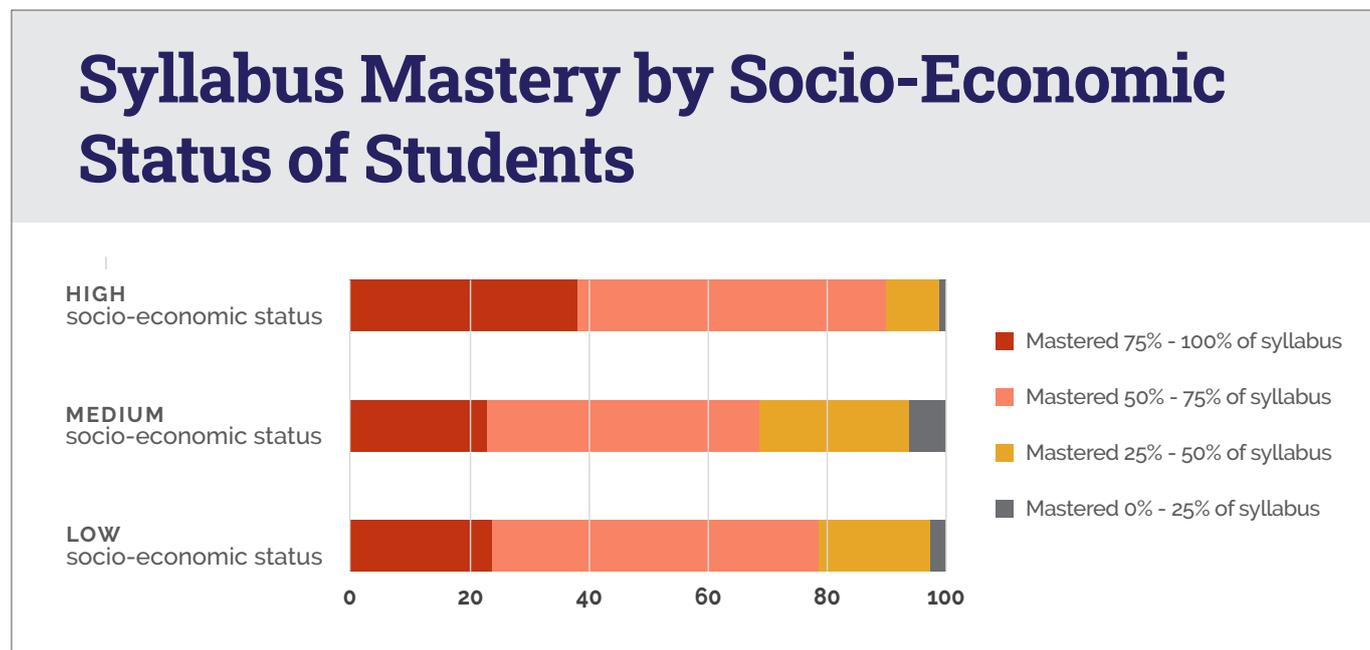
- Skill-by-skill topic coverage
- Homework and assignments
- Remedial learning for struggling skills
- Practice games, quizzes, and tests

## Syllabus Mastery During the Pandemic

While direct measurement of learning losses was outside the scope of our survey, we tried a proxy by surveying teacher evaluations of their students' syllabus mastery during the pandemic. Slightly over a third of teachers estimated that students mastered 75% or more of the syllabus, while about 66% estimated that students mastered less than 75% of the syllabus.

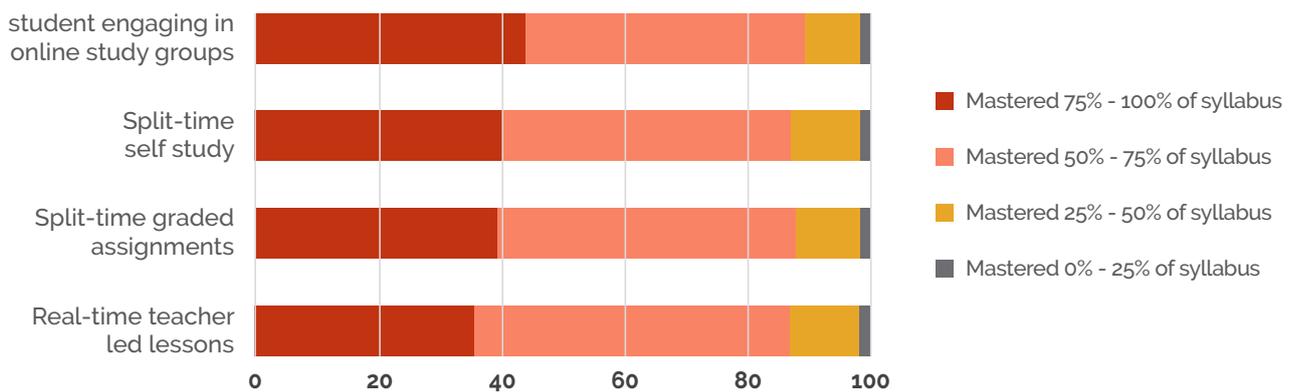


Not surprisingly, teachers who taught students of high socio-economic status felt more confident about syllabus mastery relative to teachers who taught students of lower socio-economic status. And, while teachers who taught students of low socio-economic status reported greater syllabus mastery than teachers who taught students of medium socio-economic status, our discussions with teachers indicated that students of low socio-economic status suffered most substantially.



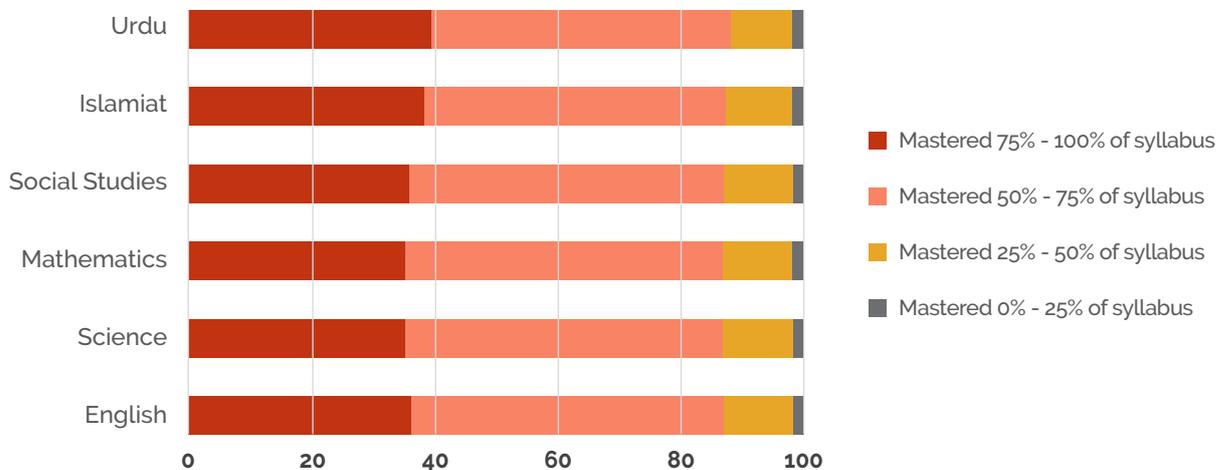
In our survey of teachers on syllabus mastery through forms of digital instruction, all forms were found to be equally effective. However, as noted previously, students and parents were considerably less enamoured by real-time (synchronous) teacher-led lessons, and preferred split-time (asynchronous) self-study by students.

## Syllabus Coverage by Forms of Digital Instruction

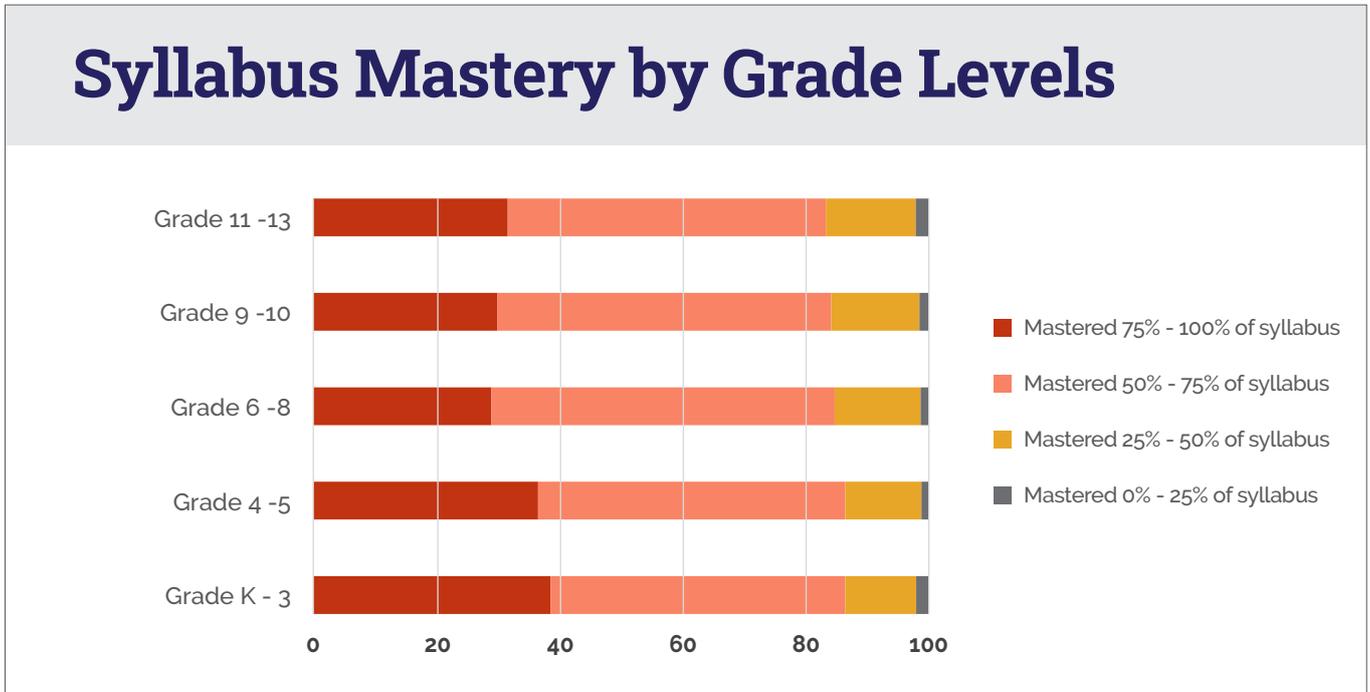


Similarly, in our survey of teachers on syllabus mastery in terms of subjects, all subjects were found to be equally effectively served by digital instruction. In our discussions with teachers, it emerged that digital instruction was less effective in imparting mastery in English language than in imparting mastery in mathematics or science.

## Syllabus Mastery by Subject



In our survey of teachers on syllabus mastery in terms of grade level, all grades were perceived to have been equally effectively served by digital instruction. However, in our conversations with teachers, a different picture emerged. In these discussions, teachers indicated that learning losses were more widespread in primary grades, and some primary school teachers suggested that students in younger grades had limited attention spans for online classes and required in-class education in their formative years.



“ My students belong to the primary category. Therefore, they felt the need of physical attention during composition topics. ”

**Primary School Teacher**  
The City School

While we do not have a very accurate picture of the extent to which digital instruction mitigated learning losses during the pandemic, we are confident in affirming that there was a reasonable level of syllabus mastery, that students of higher socio-economic status fared better than those of lower socio-economic status, and that older students fared better than younger students.

While digital instruction has had a positive impact, the practice has some ways to mature, and it is important for schools and teachers to learn the lessons derived from the pandemic to become more digitally effective.



**VI. EDTECH BEST  
PRACTICES AND  
THE WAY FORWARD**

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## Edtech is Here to Stay and Grow

While some of our respondents view the use of education technology as a stopgap measure necessitated by the pandemic, most regard education technology as an integral component of Pakistan's education journey going forward. Under this perspective, the pandemic accelerated a trend that would have gathered momentum anyway, but at a much more leisurely pace.

And, while our respondents do not view education technology as an unambiguously positive development, most appreciate the many benefits it brings to the education process. Also, most principals, teachers, students, and parents have been quite pleasantly surprised by their capacity to absorb education technology and acquire a new digital deftness in teaching and learning through technology.

Through our engagement with principals, teachers, students, and parents, we have been quite amazed by the adaptations made across the country and the best practices we have observed. We believe that the pandemic has forced educators and learners to cross the Rubicon, and their success in coping with education technology challenges, however gradual and partial, means that education technology is here to stay and grow.

“ The greatest benefit that I have witnessed for my school is that the students are now more confident learners. They have become more IT savvy; they have learned to share the learning space and have become more empathetic. Their critical and analytical thinking skills have developed. They have become confident speakers and their digital presentational skills have improved a lot. For teachers I would say that since the lessons can be easily recorded in the Google Meet classrooms, they have a bank of lesson recordings which they can refer to in future and make informed decisions based on the performance of their students. They have dramatically improved their IT skills. ”

**Primary School Principal**

Beaconhouse School System, Rawalpindi

“ Use of technology is a basic need of today's world. Used to support both teaching and learning, technology infuses classrooms with digital learning tools, such as computers and handheld devices; expands course offerings, experiences, and learning materials; supports learning 24 hours a day, 7 days a week; builds 21st century skills; increases student engagement in the class, motivation; and accelerates learning. Technology also has the power to transform teaching by ushering in a new model of connected teaching. This model links teachers to their students and to professional content, resources, and systems to help them improve their own instruction and personalise learning. ”

**Accounting Teacher**

The City School, Gujranwala

## The Public – Private Digital Divide

While there are notable exceptions with respect to public education systems (such as the Federal Directorate of Education and Federal Government Educational Institutions), the pandemic has considerably widened the digital divide between public and private education systems.

Over the past two years, many private school systems have embraced education technology, and their leaders and teachers have acquired a much deeper grasp of its modalities, potentiality, and challenges. By contrast, most leaders and teachers in the public sector have only a surface understanding of education technology. This is not only because of their limited levels of engagement with education technology over the past two years, but also because the principal preoccupation of some public school systems during this period has been on implementation of a 'single national curriculum'.

Because public schools generally serve the least advantaged children in society, the widening of the digital divide between private and public schools means that our least advantaged children have been the worst affected. Using digital technology to uplift the learning prospects of these children—and of the more than 22 million children who receive no education—is a daunting task that will require our most creative and experienced people.

We do not believe that the best way to bridge this divide is for the public sector to immediately float large tenders to catch up on education technology. We would recommend much deeper levels of engagement by public sector education leaders with private sector education leaders from both traditional and edtech backgrounds. Out of such deep engagement, solutions will arise that lift the prospects of both public and private sector education in Pakistan.

## School Level Best Practices

The best practices we have observed at the school and school system level include formation of **digital leadership** teams consisting of administrators, teachers and IT specialists. Schools that have taken education technology as a long-term opportunity and challenge and reflected this by establishing an empowered leadership team have tended to deal more effectively with the pandemic and are likely to continue to build on this success.

School investments in **teacher training, hardware, software, and bandwidth** have had a similar positive impact. On the 'soft' side, promotion of **communities of practice** among teachers and sharing of content and best practices by teachers has yielded very positive pedagogic gains.

A few schools have also moved in the direction of **integrating assessment reports from digital learning into their formal evaluation and reporting systems**. This practice provides strong messaging to teachers, parents and students of the importance and long-term role of education technology and we recommend it highly.

As we move into a hybrid post-pandemic reality, flexible strategies for physical and online deployments that have enabled schools to lower costs and adapt effectively include **à la carte learning** (some subjects are taught physically, while others are taught on a blended on online basis), **A/B blended learning** (students are rotated between physical and online learning relating to a subject), and **class rotation** (classes are rotated to optimise usage of smart, digitally-equipped classrooms).



## School and Class Best Practices



### Digital Leadership Team

Schools set up a digital leadership team.



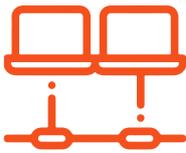
### Online Teacher Training

Schools license or establish teacher training programs.



### Community of Practice

Teachers set up physical and online community to share best practices.



### Infrastructure Support

Schools provide hardware, bandwidth, and infrastructure support.



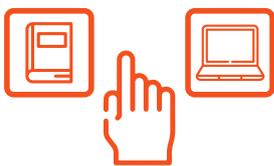
### Integrated Learning Reports

Student performance reports sent to parents include both in-class and online performance results.



### Entrance Tests

Schools administer online entrance tests for new students.



### À La Carte Learning

Some subjects are learned purely online and other are learned in-class or through blended learning.



### A/B Blended Learning

To reduce classroom size, class is segmented, and students alternate between in-class and online learning.



### Class / Lab Rotation

To optimise infrastructure, digital classrooms or labs are made available to classes on a rotating basis.

## Teaching and Learning Best Practices

Perhaps the most important innovation in Pakistan in terms of teaching and learning practices has been the adoption by schools of **blended learning** practices. Under the wide umbrella of this term, teachers have combined face-to-face lessons, with digital in-class lessons and online homework and tests, and a small dose of real-time online teacher-led learning where necessary.

In cases where teachers have combined these practices with **data-driven lesson planning** through systematic analysis of the rich performance reports made available by education technology, they have achieved very substantial learning gains. This data-centric approach to teaching has enabled teachers to recommend online learning for specific groups of students for **remedial learning** and **exam preparation** purposes.

The **flipped classroom** model, in which students are introduced new content at home through digital technology and then brought into face-to-face sessions for remedial and reinforcement purposes, is by now internationally well-recognised but has had limited uptake in Pakistan.

**AI-based learning**, in which an AI engine recommends individualised learning pathways to students, is a new paradigm in Pakistan that holds great promise. Over the past two years, students have been promoted with limited evaluation, and their foundational skills are weak. AI-based learning operates at a skills level, not at a grade level, and recommends skills to students based on their level of skills mastery rather than on their grade level. This learning approach will help build strong foundational skills during a period of deep learning losses but will require teachers to actively promote this approach to an exam-conscious student body.





# Teaching and Learning Best Practices



## Blended Learning

Teachers blend face-to-face learning with in-class or online digital technologies.



## Core Learning

Teachers use blended or online learning to cover new topics.



## Homework

Teachers set online homework assignments that are marked by the teacher or a learning management system.



## Data-driven Lesson Planning

Teachers and students use digital data to identify learning gaps and adapt lesson plans.



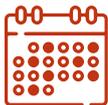
## Remedial Learning

Students study online to address learning gaps with or without teacher supervision.



## Exam Preparation

Digital technology is used to prepare for examinations.



## Periodic Learning

Digital technology is used to deliver periodic lessons and tests.



## Flipped Classroom

Students learn new topics online. Teachers provide reinforcement and remedial lessons in-class or online.



## AI-based Learning

Students use Artificial Intelligence (AI) recommendation engines that enable personal learning pathways.



## Student-led Learning

Students create and present digital content.



## Learning Games & Competitions

Digital technology is used to participate in learning games and competitions.



## Project-based Learning

Digital technology is used to collaborate on educational projects.

## Content and Technology Best Practices

At the onset of the pandemic, many teachers pulled content from the Internet and supplemented this content with self-made videos. While this strategy worked as a stopgap measure, leading schools are adopting more sophisticated content development and acquisition strategies.

This includes development by schools of **skills and attainment taxonomies** to which content is mapped, and schools becoming more organised about the type of content that will be generated in-house and the type of content that will be licensed from third parties. Usually, in-house focus is placed on development of lesson plans and assignments, and external focus is placed on licensing of videos, educational games, and assessment banks. A few leading school systems are also beginning to use **content management systems** through which all content is centrally organised, and content under development may be subjected to a systematic review and approval process.

Similarly, schools are also moving from decentralised educational systems to **learning management systems**. During the pandemic, Google Classroom had been widely adopted in Pakistan as it enables teachers to quickly set up lessons and enroll students. However, the Google system is a decentralised system that does not easily enable common use of lessons and reporting on a school-wide basis. Leading schools are now using learning management systems for more centralised student and content management and reporting capabilities. Some schools are even combining the virtues of Google tools and learning management systems to provide students with a wide range of online learning options.



# Google Classroom v Learning Management System

We are often asked about the differences between Google Classroom and a learning management system. Here is a brief contrast:

### Google Classroom

**Decentralised System**

- ✓ Access to Google suite (G Suite)
- ✓ Teacher-level assignments
- ✓ Teacher-level MCQs
- ✗ No centralised lesson plans
- ✗ No centralised content management
- ✗ No centralised reporting
- ✗ No option to reuse the content

### Learning Management System

**Centralised System**

- ✓ Teacher-level assignments
- ✓ Teacher-level MCQs
- ✓ Central lesson plans
- ✓ Centralised lesson plans
- ✓ Centralised content management
- ✓ Centralised reports
- ✓ Adaptive assessment or AI recommendation engine
- ✗ No access to G Suite features set

- ✓ Google Classroom is a decentralised, teacher-centric system with an excellent set of G Suite tools.
- ✓ A learning management system is a centralised, school-centric system with centralised student reports and centralised content.
- ✓ The best systems combine the best of Google Classroom and a learning management system.

### Google Classroom + Learning Management System

**Integrated System**

- ✓ Teacher-level assignments
- ✓ Teacher-level MCQs
- ✓ Central lesson plans
- ✓ Centralised lesson plans
- ✓ Centralised content management
- ✓ Centralised reports
- ✓ Access to G Suite features set
- ✓ Adaptive assessment or AI recommendation engine

## Conclusion: Education Technology as Practice

As educators and teachers have delved deeper into education technology, they have come to realise that the digital revolution has deep, transformative aspects that go well beyond modes of communication and content delivery. Every aspect of educational practice—from teacher training, to lesson design, to teaching, to content and to evaluation—is impacted by technology. We applaud the educators, teachers, students, and parents that have embraced such practices.

And we have no doubt that this embrace will ultimately lead to an even deeper change in the education system in Pakistan. A change in which education systems will serve the capabilities and inclinations of each individual learner. A change that will enable schools in Pakistan to offer the old Ottoman school promise:

*“No bird will be taught to swim and no fish will be taught to fly.”*

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“ You may think technology is just a distraction, but it can help encourage active participation in your classroom. Using devices like a computer, tablet, or other type of technology in your classroom can help turn traditionally dull subjects into interactive and fun activities. ”

Primary School Teacher  
The City School





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