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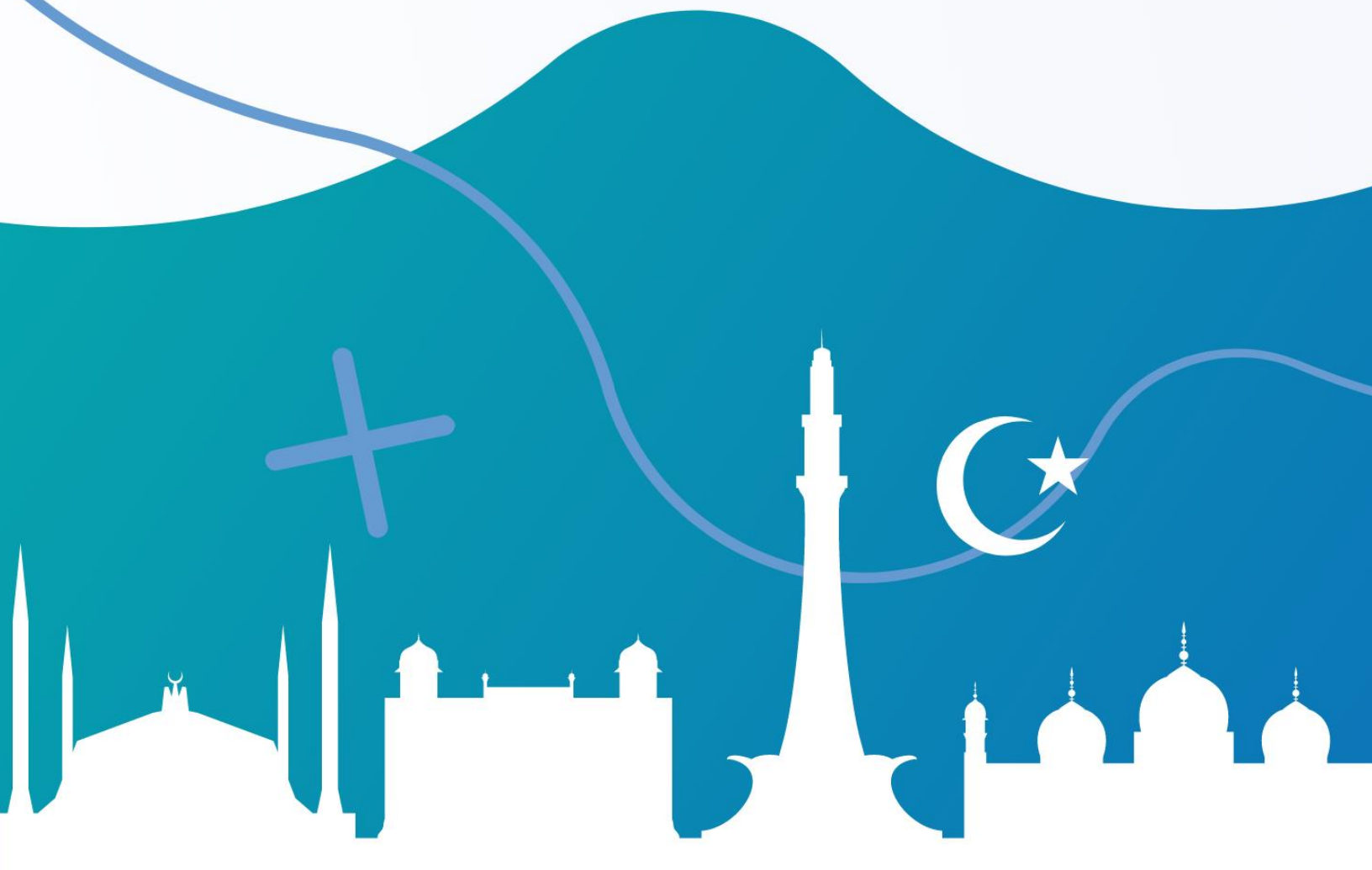
Education for Tomorrow

A FRAMEWORK FOR **DIGITAL EDUCATION** IN PAKISTAN

RECOMMENDATIONS FOR THE MINISTRY OF FEDERAL EDUCATION



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EXECUTIVE SUMMARY

Technology is changing the world as we know it, and is continuing to permeate our daily lives. Digitalization has massive benefits for societies, economies, and governments. Various sectors are transitioning towards adopting tech-based solutions in an effort to reap the benefits of digitalizing existing systems and processes.

The education sector has seen a movement towards digitalization over the past decade. Societies are recognizing that investment in education is an investment in their future growth and economic prosperity. Traditional methods of learning and teaching are increasingly being replaced or enhanced by digital technologies. This paradigm shift is not only the result of digitalization of the industry but also partly a response to increasing costs of education and the accompanying inefficiencies.[1]

While developed nations are increasingly more dependent on utilizing digital solutions in their education systems, developing nations are just beginning to embark on that journey.

This report makes a case to proliferate Digital Education in Pakistan. It provides a deep-dive into the existing challenges and opportunities in Pakistan's education sector.

This report has identified a number of important gaps that still have to be addressed to achieve quality education in Pakistan. Some of the challenges highlighted in the education sector include; a high number of out of school children, high dropout rates, gender disparity, urban-rural disparity, the lack of basic facilities in schools, challenges that can be dealt with by improving the quality of education, investing in ICT infrastructure and providing sufficient training to teachers.

The paper provides a framework to utilize Digital Education in addressing the challenges of the education sector including; the potential to improve reach and accessibility, personalize the learning experience, promote efficiency, improve learning outcomes, increase economic benefits, and ultimately create a digitally literate society.

[1] Vodafone, Connected Education, 2017

PURPOSE & OBJECTIVES

Considering the demographic circumstances of Pakistan, an ideal Digital Education policy should aim to enhance access to quality education for those who are unable to learn through conventional face-to-face and campus-based modes of learning. Digital Education provides equal opportunity to large segments of the population, especially those who either have challenges to access a campus.

The greatest challenge whilst addressing reach, inclusivity and flexibility is the program cost and student affordability. One can argue that a program delivered to masses has its benefits of scale in that, the programs can be made quite affordable. However, a student-centric program of academic value and recognition is not inexpensive to develop. Instructional design and delivery through collaboration, shared resources, faculty, and expertise make a Digital Education program not only of great academic value but equally flexible and affordable.

Student experience should be the center of any educational policy. An ideal policy should contain well-established principles of learning design for Digital Education programs paying due consideration to differentiated student experience online as opposed to a face-to-face setup.

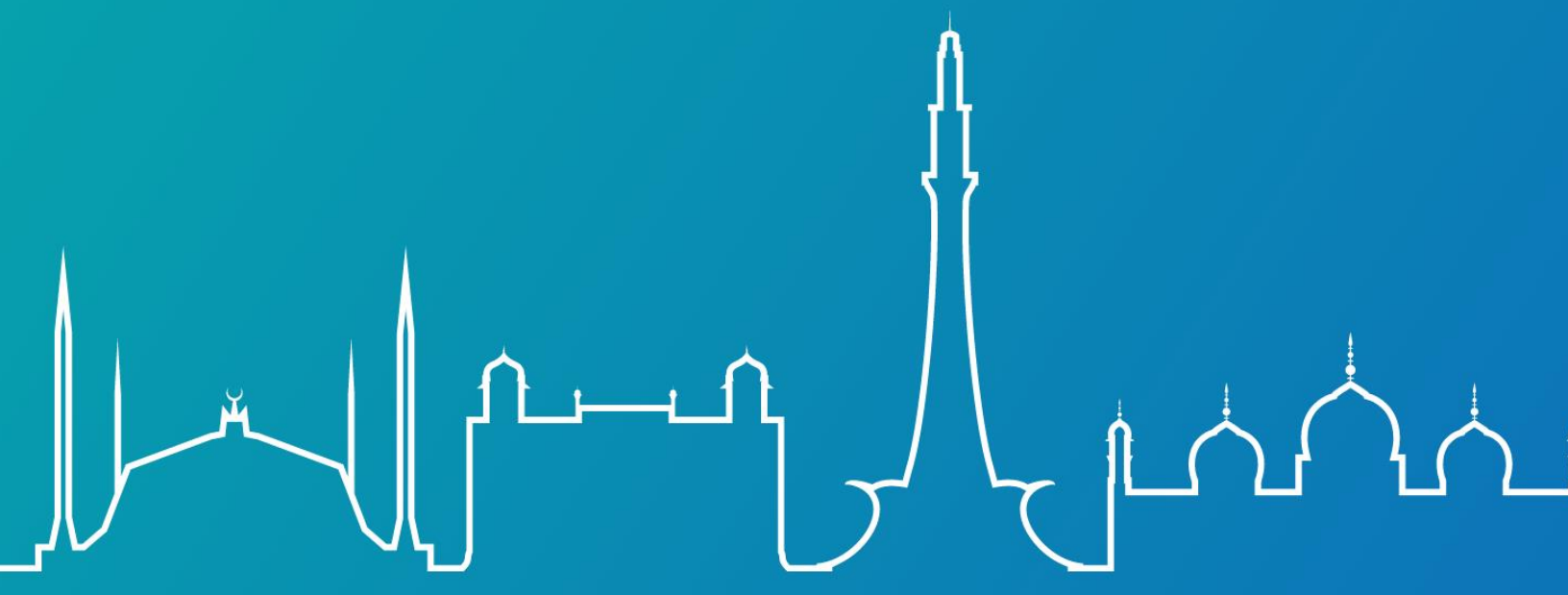
Because a sense of community is important the policy should also address issues like engagement, student support, feedback, complaint management and support for mental health and well-being. There should be clear guidelines on online learning communities for students with emphasis on support, rather than on regulation.

Programs will have greater acceptability if their academic value is maintained irrespective of the mode of delivery. Any program delivered using Digital Education must carry the same quality standard and academic value as those awarded to students who have studied conventionally on-campus. The policy should provide considerable focus on the rigor, security, and quality of assessments. If an institute can achieve excellent student experience and academic value through Digital Education, then the recognition of this mode of learning delivery will follow. Therefore, the policy should cater to a robust structure of governance and accountability for Digital Education program approval, monitoring, and quality assurance.

Lastly, standardization in terms of technology, design, governance, and student experience should be a critical consideration for a national Digital Education policy.

Information in this section was extracted from Accelerate's report named 'Accelerate to the Digital State'

Education Sector in Pakistan



Education has the power to alleviate poverty and reduce socio-economic disparities. The UN has placed education as one of its Sustainable Development Goals (SDGs). Goal 4 of the SDGs is "to ensure inclusive and equitable quality education and promote lifelong learning opportunities for all." Primary and secondary-age education is a vital part of raising living standards. Increasing rates of literacy and numeracy support growth and development and ultimately enhance employment prospects.

Even though Pakistan has recorded significant improvements in overall school participation, it still faces severe challenges in providing quality and adequate education to eligible children aged 5–16 years are out of school (Table 1), representing 44% of this age group's total population (DFID 2016). The percentage of out-of-school children aged 6–16 years is significantly higher in rural (16.7%) versus urban (5.6%) areas (ASER-Pakistan 2019).

More girls are out of school than boys at every level. In Sindh, 52% of the most impoverished children—of which 58% are girls—are out of school; in Balochistan, 78% of girls are out of school (UNICEF 2021).

Table 1: Number of Out-of-School Children in Pakistan (million), 2016

Age Group	Male	Female	Total
5–9	2.1	3.0	**5.1**
10–12	3.1	3.4	**6.5**
13–16	5.5	5.8	**11.3**
5–16	**10.7**	**12.2**	**22.9**

Source: Pakistan Education Statistics 2016–2017.

Pakistan's primary gross enrollment ratio increased from 59% in 1990 to 71% in 2000 and 94% in 2019 (UNDP 2020). In 2019, Pakistan's gross primary education enrollment rate was 95.4% nationwide—102.3% for boys and 87.9% for girls (World Bank 2021). However, only 70% of the children entering primary school were estimated to reach Grade 5, with considerable provincial differences (Table 2). Gross and net enrollment rates at the primary, middle, and high school levels in Sindh and Balochistan consistently fall below those in Punjab and Khyber Pakhtunkhwa (KPK) (ADB 2019). Low enrollment and student absenteeism in primary schools are consistent concerns in rural areas (Riaz et al. 2015).

CHALLENGES

Pakistan faces a myriad of challenges in its education sector. Despite the fact that every child is guaranteed a right to an education under the Constitution, over 47% children are out of school.47 Schools are under resourced with many children lacking basic access to quality education. Despite persistent access and quality challenges in the education sector, public spending on education was only 2.9% of Pakistan's gross domestic product in 2018, much lower than in other comparable countries. Research conducted by the Pakistan Coalition for Education highlights that most of the education budget is spent on salary payments. In contrast, a minuscule amount is spent on non-salary programs and development. Technology, however, has the power to democratize education, providing access to the best educators to those in the most remote or underprivileged communities.

Access

- Out of School Children
- Urban-Rural Disparity
- School Drop Outs
- Gender Disparity

Quality

- Quality of Education
- Untrained Teachers
- Basic Facilities in Schools

Out of School Children

Even though Pakistan has recorded significant improvements in overall school participation, it still faces severe challenges in providing quality and adequate education to eligible children aged 5–16 years are out of school (Table 1), representing 44% of this age group's total population (DFID 2016). The percentage of out-of-school children aged 6–16 years is significantly higher in rural (16.7%) versus urban (5.6%) areas (ASER-Pakistan 2019).

- **School Dropouts:** 52% of boys and 30% of girls drop out of school as they are unwilling to go to schools. Out of this, 41% of student drop out after primary school.

Gender Disparity

The literacy rate for females across Pakistan is a meager 48% in comparison to the 70% literacy rate reported for males. ("Economic Survey of Pakistan (2016-17) – Education", Ministry of

Finance, Government of Pakistan) Only 51% of women in Pakistan have ever attended school and in rural areas this number is even lower at 40%. Cost is also highlighted as an issue with 13% of women reporting it to be too expensive to attend school. While 10% of women have never attended school because they are situated too far.

Urban-Rural Disparity

The disparities amongst rural and urban areas are evident as the literacy rate remains much higher in urban areas (74%) than rural areas (49%).52 Children in urban cities have better access to education as there are more schools in closer geographic proximities. Furthermore, school councils also focus more resources on schools in metropolitan areas. Students living in rural areas on the other hand must cross larger geographical barriers to reach their educational institutions. Furthermore, the quality of education is also lower in rural areas due to more untrained teachers.

Quality of Education

The quality of education is extremely poor nationwide. In addition, there are infrequent evaluations and feedback by teachers in many schools.

Statistics collected by Alif Ailaan, Pakistan District Education Rankings, 2016 indicate that:

- 44% of children in class 5 cannot read a story in Urdu, Sindhi or Pashto
- 48% of children in class 5 cannot read a sentence fluently in English
- 49% of children in class 5 cannot perform simple two-digit division

Basic Facilities in Schools

Statistics indicate that the condition of schools in the country are below par:

- 49% of schools function without electricity
- 4 out of every 10 schools have no drinking water
- 1 out of every 3 schools is missing a toilet
- 1 out of every 3 schools is without a boundary wall

Scarce resources for schools are also being wasted. Today, there are approximately 8252 non-functional and ghost schools in Pakistan.

Undertrained Teachers & High Teacher Absenteeism

Another challenge is undertrained teachers who are not able to contribute meaningfully to learning process. Furthermore, teacher absenteeism is a huge issue. Research shows that 8%-15% of government school teachers are absent on any given day.

About Digital Education

WHY DIGITAL EDUCATION?

Several actors can benefit from utilizing technology in the education sector. These include the individuals, the communities, the government, as well as private corporations. Digital Education:

• **Improves Reach and Accessibility**: Digital Education simplifies the access of the masses to education resources and experts. Through different tools of technology, it overcomes traditional constraints of time and space. Hence, it promotes equal access and increases potential reach. Digital Education can thus provide access to education for students who are out of school.

• **Personalizes the Experience:** Digital Education personalizes the education experience for learners by offering flexibility and tailoring the learning experience. This in turn helps improve the learning experience for students. It improves their academic performances, leads to better classroom practices, improves digital literacy, and helps eradicate illiteracy.

• **Reduces Information Asymmetries**: Devices with mobile connectivity improve learning and engage students and teachers, leading to a variety of benefits, including the real-time assessment, increased innovation, and the empowerment of women and disadvantaged population groups. Remote learning can also help reduce gender and urban-rural disparities in education. The access to education ultimately reduces information asymmetries and equalizes opportunities for the masses.

• **Promotes Efficiency & Transparency**: As processes are digitalized in the education system, efficiency and cost savings are promoted. Furthermore, attendance of both teachers and students can be monitored through the use of digital technology. In addition, communication can also take place more effectively between parents and the schools.

• **Improves Learning Outcomes**: Digital Education represents a profound shift in the way education is delivered and received. The advantage of online learning is that it is flexible, adaptive, and interactive. For example, in the United States, 3 years after educators began using mobile based computing devices to assess the progress of individual students and tailor lessons to their needs, the oral fluency of kindergartners tripled.[2] Hence, Digital Education can help improve the quality of education provided.

• **Increases Economic Opportunities**: Not only does education have the potential to reduce child poverty and improve job opportunities, it also has the potential to have large scale economic benefits.

• **Creates a Digitally Literate Society:** Those with a higher level of education are not only more digitally literate, they are likely to more easily recognize the value of access to new sources of information and be better equipped to take advantage of it.

[2] McKinsey & Company, GSMA, Transforming Learning Through mEducation, 2012

GLOBAL LEARNINGS IN DIGITAL EDUCATION

Across the globe, countries are fast picking up the opportunity to digitalize their education systems. Most of the countries have taken a national level strategy route and have done efforts to build an ecosystem. Some key learnings are shared below –

Korea – A Case Study[3]

1. Education Master Plans

Since 1996 the development of ICTs within the education system of the Republic of Korea has been implemented under three national master plans. The first Master Plan (1996—2000) was focused on the establishment of a Digital class ICT infrastructure in elementary and secondary schools. The objective of the second Master Plan (2001— 2005) was to enhance the quality of education by allowing open access to educational content and providing teacher training for the integration of ICT into classroom teaching practices. In addition, the National Education Information System (NEIS) was developed as a computer network maintained by the Ministry of Education to facilitate the electronic management of all education-related administrative tasks. The third and most recent Master Plan (2006— 2010) has been focused on the creation of sustainable learning environments with u-Learning and future education through more flexible and secure educational services such as the development of digital textbooks.

2. Governance Structure

The use of ICT in education in South Korea has been driven by a strong cooperation among three key players: Ministry of Education, Science, and Technology (MEST), Korea Education and Information Service (KERIS), and 16 Metropolitan Provincial Offices of Education (MPOEs). MEST has been coordinating the processes from policy planning to implementation. As a government agency, KERIS has been playing exclusive role in supporting and planning implementation of the national ICT policy. Sixteen MPOEs have been autonomously implementing the national ICT policy at the regional level.

3. Infrastructure

The establishment of ICT infrastructure in schools was aimed to promote education equity by bridging the digital divide. The School Advancement Project, which included the establishment of school LANs, Internet-connected multimedia labs, provision of PC and information devices for classrooms, and personnel support, had been implemented according to the three national master plans. Since the miDigital 1990s national initiatives for supporting ICT integration into the school curriculum have been gathering momentum. The projects ranged from educational content such as supplementary materials and educational software for the development of digital textbooks.

[3] UNESCO, E-Learning in the Republic of Korea, 2010

Educational content, which almost in full has been provided and shared in EDUNET, plays an important role in the curriculum integration of ICT.

4. Teacher Training

Since the late 1980s the South Korea government has provided teacher training for both ICT literacy and integration purposes. The focus of teacher training, however, has changed over the course of the three master plans from computer literacy to curriculum integration. In addition, the government has built the teacher training framework for ICT in education to meet the specific needs faced by teachers throughout their career. The new teacher roles and adequate ICT competencies should be taken into consideration for the future design of teacher training.

5. Digitizing Educational Materials[4]

In 2011, South Korea started its US$2.4 billion effort to digitize all educational materials by 2015, making them accessible through computers, tablets and smartphones. This attempted to enable education through technology at lower costs. Each school was also slated to have its own cloud computing system to store the digital curriculum for students seeking study material.

Philippines – Investing in People: Digital Literacy for All[5]

The Philippine Digital Strategy (PDS) 2011-2016 aimed to address the needs of the formal sectors as well as the marginalized communities in the Philippines. Innovative approaches were taken to ensure the digital inclusion of all sectors of the population, including support for disabled people. Special focus was placed on content development and delivery of ICT trainings. Broadband Internet access and integration of ICT in curriculum across all levels of the education system were prioritized to ensure a skilled workforce.

Philippines – Tech4ED[6]

In 2015, the Philippines' Department for Information and Communication Technology initiated the Technology for Education, Employment, Entrepreneurs, and Economic Development (Tech4ED) Project. These multi-purpose community public access points, provide affordable or free-of-charge access to the internet. Each center is provided with access to the Tech4Ed Platform and Learning Management System (LMS). The Platform has various content and learning materials classified in 5 segments:

[4] South Korea (Pawel Piejko, South Korea plans to withdraw printed textbooks from schools by 2015, 2011
[5] DICT Department of Information & Communications Technology, "The Philippine Digital Strategy Transformation 2.0: Digitally Empowered Nation," 2011
[6] DICT Department of Information & Communications Technology, "Tech4Ed," Retrieved from: http://dict.gov.ph/tech4ed/about-us/

- **e-EduSkills**: aims to deliver e-Learning on demand to address the education divide.
- **e-Assist**: Focuses on providing learning and continuous skills development opportunities for digital inclusion for special sectors such as women, People With Disabilities (PWDs), senior citizens, etc.
- **e-GovServe:** Provides direct government services to rural communities through the Tech4Ed Centers. This segment is an aggregation of various content and services from other government agencies, making the Tech4Ed Platform a one-stop shop for selected government services.
- **e-Agri:** contents and services on agriculture technologies for farmers and fisher folks.
- **e-Marketplace**: Provides greater market reach beyond the entrepreneurs' community for exponential economic growth and opportunities.

The project has been very well received in the Philippines. From 2015-2017, 700 target centers grew to 2,121 centers. Registered platform users grew from 35,824 in 2016, to 91,017 in 2017.

Recommendations for **Digitizing Education** in Pakistan

RECOMMENDATIONS' SUMMARY

Countries around the world are adopting different routes to incorporate Digital Education into their society. This paper suggests that there are four key components required in order to expedite the adoption of Digital Education in Pakistan.

Government Prioritization of Digital Education

- Establishment of the Committee on Digital Education
- Allocate and create a Digital Education Fund

Enable Access

- Invest in ICT Infrastructure
- Provide Connectivity

Focus on Digital Literacy

- Introduce digital strategies and curriculums
- Create programs for Digital Skills
- Provide Teacher Training

Involve all Stakeholders and Define Roles

- INGOs, Public Sector, Private Sector
- Hardware & Software Provision e.g., Mobile Financial Services, Security

In order to fully utilize the opportunities that this transformation brings, several actors need to rethink the way education is delivered. As learned by other countries, a series of enabling actions from; policy-makers and educational institutions; education providers and the private sector, particularly mobile network operators, is necessary to gain and sustain a Digital Education system.

GOVERNMENT PRIORITIZATION OF DIGITAL EDUCATION

To reap the benefits of ICT across the education system, a clear and integrated ICT centric Education Ecosystem must be created. Yet, it is important to note that this only possible if digitalization is prioritized by the nation and endorsed from the highest level of authority. This can be at the Federal level, as well as the provincial level which should cascade down to the relevant education bodies.

1. Establishment of the Committee on Digital Education

In order to highlight the importance of Digital Education, a separate National level Committee on Digital Education must be created. This would ensure a minimum level of standardized education. By establishing a clear governance structure that endorses and prioritizes the digitalization of the education sector, bigger impacts can be made. Policy-makers and educational institutions who are the ultimate orchestrators of this transformation need to get a clear, holistic view of the opportunities ahead and create levers for all parties to realize them.

Furthermore, distinct targets must be set along with a clear action plan to integrate ICT in teaching. Progress should be continuously followed up and evaluated. Following implementation, the Committee would benefit from annual or biannual examination and evaluation of the current state in terms of ICT maturity set against the desired state, and outlining of clear action plans to close the gaps. Prerequisites should also be required for teachers to integrate ICT into their teaching by, e.g., allocating time and funds for training. Support should also be available to share digital content and teaching practices across provinces and districts.

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2. Allocate and Create a Digital Education Fund

A separate fund should be allocated for Digital Education by the Government. A digital education fund means that Digital Education would be both prioritized and expedited. Funding can help provide hardware, software, and training that would ultimately reform the education sector in the country and help students to uptake digital skills.

ENABLE ACCESS

Without the provision of the correct infrastructure and connectivity, access to Digital Education remains futile and untapped.

1. Invest in ICT Infrastructure

ICT Infrastructure can be broken down into two distinct components – hardware and software. Hardware devices used in Digital Education are handheld, Internet capable and are carried by most people. Most commonly, they are mobile phones, personal listening devices such as mp3/mp4 players or lightweight, portable computers such as slates, tablets, netbooks and small laptops.

The software utilized in Digital Education primarily consists of content creation and provision. The range of potential content providers is huge and includes small and large companies in a number of education and media segments, government and education organizations and institutions, and even individual or groups of learners and educators, through user-generated content and custom publishing. Importantly, for use in formal education settings, content must be mapped to some kind of curricula or learning outcome, or educational need.

2. Provide Connectivity

While infrastructure is the main tool to disseminate Digital Education amongst the masses, another critically important tool is connectivity. This connectivity is what will enable the devices to connect to learning materials, other students or teachers and to the Internet. Increased access to affordable and reliable networks is seen as a significant driver of the growth of Digital Education.

PROMOTE DIGITAL LITERACY

In order for there to be an uptake of digital technologies and eventually, Digital Education, it is imperative for the society to become digitally literate.

1. Introduce Digital Strategies and Curriculums

Many nations recognize that the only way for digital skills to penetrate down to the grassroots is by introducing strategies and curriculums that push the digital agenda forward. These strategies must focus on ensuring that digital technology is a central consideration in all areas of curriculum and assessment delivery. They ought to drive innovation and investment in digital technology for learning and teaching.

Key focus areas of different strategies highlight the provision of ICT trainings to develop the skills and confidence of teachers and also aim to improve access to digital technology for all learners.

Furthermore, relevant curriculum intervention should also be looked at. Introducing more ESL and STEM programs into the curriculum will help develop a more digitally literate society. While it is important to train for digital skills, it is also important to upgrade the existing curriculum to inculcate the teaching of more digital centric content such as Artificial Intelligence and Robotics in Higher Education institutions.

2. Create Programs for Digital Skills

The Government must initiate more programs focusing on promoting the uptake of digital skills. These programs should seek to bridge the digital divide, i.e. the gap in the skills to use computing devices for the purpose of teaching and learning among urban and rural teachers and learners in Higher Education domain and empower those, who have remained untouched by the digital revolution and have not been able to join the mainstream of the knowledge economy.

3. Provide Teacher Training

Programs focused on providing teacher training must be initiated in order to guarantee the sustainability of Digital Education. For example, Microsoft has partnered with many states throughout India to provide free basic technology training to teachers of state-funded schools. This includes 'The Innovative Teachers Forums' that encourage innovative teachers to adopt ICT, award best practices in ICT integration, and support teachers in building global communities of practice. (Hitendra Pillay and Greg Hearn, Public-private partnerships in ICT for education)

INVOLVE ALL STAKEHOLDERS AND DEFINE ROLES

The development of a holistic ecosystem is possible only through the involvement of various stakeholders, with the converging agenda of digitalizing the education sector. The vision and goals, led by the top-most echelons of national policy-making has to eventually be translated in to SMART targets which are subsequently monitored and evaluated. For this whole process to work, the collaboration of various partners is needed:

1. Policy Makers (National and Provincial) & Education Authorities

- Ownership of policy development and implementation
- Appropriate governance structure at national & provincial levels
- Deployment of technology infrastructure (such as, access to broadband and mobile handsets)
- Formulation of supportive and transparent regulations
- Local examples: Ministry of Federal Education and Professional Training (MoENT), Provincial Education Bodies, Higher Education Commissions, Khyber Pakhtunkhwa Information Technology Board (KPITB), Punjab Information Technology Board (PITB)

2. Educators

- Implementation of policies and programs
- Provision of ICT trainings to teachers and institution educators
- Maintenance of technology infrastructure (such as, access to broadband and mobile handsets)
- Monitoring of new policies and initiatives
- Liaison with education bodies and IT Boards

3. Device Manufacturers, Content & Software Providers, & Distributors

- Provision and distribution of technology such as LMS software to education institutions
- Digitization of existing content
- Creation of user-friendly content
- Monitoring and maintenance of software & hardware
- Training of instructors on ICT equipment

4. Internet Providers

- Provision of Connectivity
- New business opportunities using a proven model that increases readiness for technology adoption
- Ability to reach new customer base early, for longer-term benefits
- Opportunity to achieve business and social benefits by increasing access to technology

5. Local NGOs

- Direct access to otherwise unreachable students
- Ability to test and validate academic research and innovation in real-world applications
- Opportunity to solve practical problems and share best practices with communities
- Enhanced student learning through hands-on projects
- Local examples: Pakistan Coalition for Education

Framework for a Digitial Education Program

DIGITAL EDUCATION TYPES AND TECHNIQUES

An ideal Digital Education program should consider all types of effective learning, which can be sufficiently covered using the following Digital Education types and techniques. Schools should be given complete flexibility to adopt any one or more type or technique of Digital Education, depending upon its need and effectiveness for the program.

1. Live Virtual Classrooms

A live virtual classroom is where students and tutors meet to interact and communicate with audio, video and content. It is also referred to as real-time online classes or a live video and content streaming. Live-online technology incorporates registration and access control; therefore, it is also sometimes termed as synchronous online delivery.

Since the lectures are delivered online, these are supported by a pre-announced schedule and may also require pre-reading, attendance monitoring, and student attention to the screen being displayed. The content of a live-online program may be shared using any of the following tools:

- Capturing a manual whiteboard on camera
- Smartboard integrated with live streaming
- Computer screen sharing/ desktop sharing
- PowerPoint and other presentation tools
- PDF and other annotation applications
- Webinars, podcasts, interviews, etc.

2. Online learning

Online learning is self-paced learning which is also referred to as E-learning or electronic learning. Online learning is usually delivered asynchronously where students learn on their own time without the real-time instructor. The course content, lessons, pre-recorded lectures, tests, quizzes, homework and assignments can be accessed by the student at any time. Some e-learning courses may additionally include live-online classes, virtual meetings, or face-to-face interaction as part of the course activities. Therefore, there is a potential to offer e-learning in a synchronous mode as well.

A typical online learning program may comprise of the following content:

- Pre-recorded lecture videos
- Mandatory reading (articles, reports, blogs, guides, journals, whitepapers, etc.)
- An electronic copy of a textbook (e-book)
- PowerPoint presentations
- Charts, graphs, infographics, checklists, etc.
- Case studies, illustrations, etc.

3. Interactive Online Learning

Interactive Online learning is a pre-designed, automated and tutor-less electronic learning environment that requires a student to actively participate in learning through a computer by performing various reciprocal electronic tasks. Within an interactive online learning environment, a student interacts with the content to perform tasks, solves problems and evaluates arguments to achieve carefully set learning outcomes.

An interactive online learning program may include any of the following learning types:

- Scenarios and simulations
- Quizzes and surveys
- Interactive assessments
- Character dialogue and role plays
- Games & problem solving
- E-book with built-in interactive content

4. Blended Learning

Blended learning is a style of education which combines face-to-face learning with distance education. In a blended learning model, the distance learning part may be delivered using correspondence, e-learning or interactive online learning whilst, the face-to-face part using conventional classroom or live-online lectures.

The face-to-face part is usually supported by a pre-announced lecture schedule whereas, in the distance learning part students learn on their own without a real-time tutor. Blended learning is best delivered using a synchronous learning management system that combines face-to-face with distance learning.

A mix of live-online and e-learning may also be classified as blended learning. However, for the purpose and scope of this document, blended learning includes a combination of face-to-face classroom learning and distance learning.

5. Open Learning

Open learning is a form of knowledge delivery using, easy to access, open educational resources, correspondence, technologies, and learning communities. It is usually a learning activity based on independent study rather than formal classroom instruction that allows students the flexibility to choose from a variety of options regarding the learning schedule, location, pedagogical method, modes of access (online or offline) and other factors related to the learning processes.

Open learning cannot be restricted to specific types. However, the following most used types have been considered for this document

- Massive Open Online Courses (MOOCs)
- Correspondence education
- Home and independent study
- Continuing education/ Continuing Professional Development (CPD)
- Vocational and professional trainings
- Self-paced adult education

MODES OF DIGITAL EDUCATION DELIVERY

A learning eco-system comprises of activities and tasks associated with learning delivery as well as governance, administration, finance and support. Students in a Digital Education environment are distinctly located, therefore, synchronization between learning and support systems is necessary.

Depending on the extent of deployment, schools may adopt Learning Management Systems (LMS) synchronized with administration and finance.

Schools may be allowed to offer their open and distance learning programs using a synchronous system that integrates various types of Digital Education as well as with CMS, LMS, assessments, ERP, digital marketing and social media platforms. Schools should have the flexibility to decide the extent of customization for their various systems based on their capacity, academic, oversight and governance needs.

1. Learning Management System (LMS)

A learning management system is a software/ application that is designed to offer online education. An LMS may also provide various support functions including administration, documentation, content creation, content distribution, tracking, reporting, broadcasting, assessments, and feedback.

LMS features vary based on specific needs, the number of users and Digital Education mode.

Deployment of an effective LMS should be an integral part of a Digital Education policy. There are distinct advantages in adopting an LMS, including the organization of learning content in one central location to avoid the risk of losing important data, easy administration, remote creation of content in predefined templates, packaging of various pieces of content to develop a new program or modify an existing one, access control, analytics, insights, and real-time compliance with various internal and external policies.

The Digital Education policy should suggest deployment of a synchronous LMS supporting various types and techniques of learning delivery as well as addressing the six learning types.

Clear guidelines should be provided for schools to integrate the LMS with other systems including CMS, FMS, ERP, digital marketing and social media platforms.

For standardization, Ministry of Federal Education should suggest an appropriate LMS. However, the following three options are generally available for acquiring an LMS

a) A managed open-source solution with customization.
b) An off-the-shelf solution.
c) Building their own.

Features of the Learning Management System

- ✓ Commonly available learning management systems offer the following features and functionalities;
- ✓ Access controls with job hierarchies, authentication, and security.
- ✓ Ability to customize learning delivery in line with academic compliance set for the program.
- ✓ Authoring tools for content and assessment creation with a variety of upload options.
- ✓ Option to white-label and customize branding, layout, fields, functionality, and reporting.
- ✓ Digital library to host self-developed content and any reference material.
- ✓ Storyboarding and lesson planning tools.
- ✓ Program management tools for registrar enrolments, creating batches, allocating tutors, monitoring attendance & attention, capturing feedback & complaints and administrative reporting.
- ✓ Built-in video conferencing tools with recording capabilities for tutor-lead live-online classes.
- ✓ Live delivery tools like mute participants, live polls, chat box, question box, survey, hand raise and prompts.
- ✓ Digital canvas to present real-time content including documents, presentations, and graphics.
- ✓ Password enabled student portal with a user interface containing personal details, course subscription, learning content, lesson plan, academic calendar, student handbook, fees and dues, feedback and complaints and disciplinary procedures.
- ✓ Content management tools for assigning, sharing, editing, and archiving with ability to download learning content, study support resources, lecture recordings and academic calendars, etc. for offline learning.
- ✓ Ability to access learning content and live-online using a variety of devices including mobile phones.
- ✓ Data collection, management, integration, and backup along with cybersecurity.
- ✓ E-commerce platform for student fee collection along with transaction security and option to synchronize with FMS and ERP.

- ✓ Communication and notification integrated with reminders and calendar prompts.
- ✓ Course catalogue with the option to subscribe to an open course or submit an application for a regulated program.
- ✓ Document management both for the registrar office as well as for assignments and other submissions.
- ✓ Exam engine to deliver objective test and constructed response exams with self-marking facility for objective questions.
- ✓ Exam marking and coursework grading feature with reporting capabilities.
- ✓ Skills and competency assessment through integrated simulations and exercises.
- ✓ Social networking, learning and discussion tools with the options to create learning communities, discussion boards and blogs, etc.
- ✓ Student performance tracking and credit-earning integrated with examination and attendance features.
- ✓ Option to offer blended learning by integrating live-online and e-learning.
- ✓ Ability to issue completion certificates, transcripts, and degrees.
- ✓ Ability to deliver Massive Open Online Courses (MOOCs).

COMPONENTS OF A DIGITAL EDUCATION POLICY

The Digital Education policy should ideally provide a quality assurance framework and set of guidance tools on all aspects of a Digital Education learning eco-system including course design & development, a learning outcome & competency framework, program management, a learning management system, knowledge bank/ library, assessment & examination, progression & award, accreditation & recognition.

The following section provides suggestions for an effective Digital Education policy however, based on individual circumstances of each school and their online readiness, the policy components may be customized appropriately.

A. Course Design and Development

Digital Education programs should be purpose-built keeping in view student needs and academic value. An effective learning design is important to justify equivalence with a conventional face-to-face program and to impart a degree of confidence by society and employers.

The following section includes guidelines on Digital Education course design and development

1. Academic Governance

- All Digital Education programs offered should follow the same academic governance rules, policies, and guidelines as set for the conventional face-to-face program.
- Any new program being offered through Digital Education should be subject to approval from the academic boards or similar governing bodies.
- Individual schools should appoint a program lead for each Digital Education program being offered.
- Change to an existing face-to-face program to blended, online or distance learning should require approval from governing bodies.
- Schools should ideally establish a center for Digital Education delivery or appoint a technical advisor/ member to the academic board to assist and guide in technological aspects of Digital Education course design, development, and delivery.
- Governing bodies should meet periodically to review the performance of the Digital Education program along with data analytics to make necessary changes for improving the quality of the program.

2. Learning Content and Library (Online and Offline)

- Schools should be required to develop a variety of comprehensive study material and online learning resources designed for active learning and suitable for the type of Digital Education delivery being adopted for the program to support distance learning pedagogy.
- Schools should produce an instructional video, a student handbook, or a study guide to familiarize students with various aspects of the Digital Education program.

- Learning content should be aligned with course objectives, learning outcomes, scheme of study, competencies and skills being developed.
- Digital Education program content must account for unconventional nature of delivery therefore it should be interactive, enabling, progressive, transformational, and engaging.
- To maintain flexibility, the content should be broken down into smaller learning objectives feeding into a comprehensive course plan and scheme of study.
- Schools should develop a central content repository or digital library for students to access remotely.
- Schools should provide online access to the content database which may contain suggested reading material including books, journal, articles, case studies, research papers, etc.
- For a live-online program, schools should produce shareable and displayable content including presentations, quizzes, polls, surveys, etc. to closely align the delivery with conventional mode.
- Content for e-learning and/ or interactive program should go through a careful, Digital user focused, instructional design and delivered through an online platform.
- Digital learning should be designed and developed using a Learning Management System with an electronic scheme of study using a variety of methods including lecture videos, e-books, presentations, illustrations, etc.

3. Learning Support Resources

- Access to suitable library services and resources is important for achieving bigger academic objectives. Schools should therefore produce a set of learning support resources considering the need of a distant learner.
- Resources should include but not be limited to suggested readings, open-source videos, net surfing and browsing certain websites, etc.
- Schools should collate all relevant learning support resources in a resource bank or provide hyperlinks in the electronic lecture plan.
- Schools should provide specimen/ mock exams within the resource bank along with suggested solutions and marking guides.
- Schools should provide a dedicated portal for students to ask questions and request additional tutorial support.

4. Lesson Planning

- All Digital Education programs offered by a school should follow the same curriculum and credit scheme as set for the conventional face-to-face program.
- Credit hours of a Digital Education program should be distributed amongst all types of learning delivery methods including live-online, face-to-face, e-learning, workshops,

access to recorded lectures, self-assessment, interactive online learning, examination, projects, peer-review, mandatory reading, simulations, laboratory experience and practicals.

- The lesson plan should include details of contact hours with a tutor along with its schedule as well as details of any self-paced learning.
- Schools should create a lesson plan for each Digital Education program according to the type and mode of delivery offering flexibility and greater scope than a pure classroom learning program.
- Digital Education programs should have the same course objectives and learning outcomes as a conventional program.
- Credit hours of a Digital Education program should be distributed among all types of learning delivery methods including; live-online, face-to-face, workshops, access to video lectures, self-assessments, examinations, projects, peer-reviews, mandatory reading, simulations, laboratory experience and practicals, etc.
- All lesson plans should be subject to the same level of governance and academic compliance as a conventional program.
- The lesson plans should include details of contact hours with a tutor along with its schedule as well as details of self-paced learning.
- Lesson plan of a Digital Education program should be automated and available to students electronically with embedded hyperlinks to learning content.
- Where possible, lesson plans should be designed to embed them in a learning management system.

B. Program Management

1. Admission and registration

- Schools should provide flexibility in terms of the period of registration and admission criteria based on minimum academic prerequisites as opposed to setting quotas or merits.
- The focus of entry requirements of a Digital Education program should be to recruit students meeting minimum requirements with diverse entry routes to deliver quality learning to achieve the same outcome as for the conventional face-to-face program.
- Schools should enable online submission of admission application along with the facility to upload relevant academic and personal documents.
- Schools should issue electronic joining instructions to successful applicants upon their enrolment.

2. Student Data

- Schools must ensure complete security of the student data held on their filing system.

- Schools should be encouraged to synchronize their student data with a Learning Management System (LMS), Financial Management System (FMS), Campus Management System (CMS) or Enterprise Resource Planning (ERP) system.
- Schools should introduce reliable cybersecurity systems to ensure the protection of student data from cyber-attacks.
- Schools should include data protection and disciplinary procedures within their employee handbook and staff contracts.
- Schools should provide sufficient backup of electronic data through secured remote servers.

3. Student Identification

- Schools should issue a unique identification number/ enrolment/ roll number to each student signing up for an Digital Education program.
- Student identification checks and real-time proctoring should be made mandatory if assessments are conducted remotely or online.

4. Attendance and Attention

- Schools should ensure that attendance on a Digital Education program is monitored regularly in compliance with program regulations and credit scheme.
- Attendance should include attending live-online and face-to-face lectures, workshops, accessing video lectures and tools to measure the time required for mandatory readings.
- Schools should use such technologies for live-online that capture student attendance as well as attention on the screen being displayed.
- Attendance deficit on a live-online program should be supplemented by attentively watching a recorded video of the live online lecture.
- Schools should ensure that e-learning and simulations are designed to cater to the attendance and attention element of the Digital Education program.

5. Student-centered Approach

- Schools should ensure that the student remains at the center of an Digital Education program design, development, and delivery.
- Schools should ensure that any complex software installations by students are supported with step-by-step guides and technical support helplines.
- Schools should build a parallel student support function and helpline to ensure uninterrupted delivery of an Digital Education program.
- Schools should ensure that technology and design used for Digital Education program caters for the needs of students with disabilities.

- Schools should provide each registered student with a password enabled student portal containing personal details, course subscription, learning content, lesson plan, academic calendar, student handbook, fees and dues, feedback and complaints and disciplinary procedure.
- Schools should introduce a feedback system for all aspects of the Digital Education program.
- Student feedback should be collated at program and batch level periodically throughout the duration of the program.
- Student feedback statistics should be used for academic governance, performance appraisals and modification of the Digital Education program.
- For continuous quality enhancement, schools should be required to set student satisfaction targets for faculty, admin & support, and monitor performance against these targets periodically.

6. Student Submissions

- Any deadlines, formats, content, guidelines, and submission protocols should be shared with students in the student handbook and joining instructions.
- Students should be allowed to upload their dissertations, assignments, projects, and thesis through student portal on the LMS via secure login or via registered email ID.
- Schools should ensure that each submission is assessed on the automated plagiarism tools like Turnitin before evaluation and grading.
- Graded and marked submissions should be returned to the student electronically through LMS or to the registered email ID of the student.

C. Experiential Learning

Experiential learning is a process of exposing students to practical experience either within a laboratory, classroom, community, or workplace to increase knowledge, clarify concepts, develop skills and behaviors.

The types of experiential learning within an academic environment include laboratory work, practicals, internships, industry visits, research projects, fieldwork, simulations, gaming, and role-playing.

- Schools should ensure that required direct supervision of the tutor is available for all Digital Education programs requiring experiential learning.
- Simulations or games should be embedded within the course structure and lesson plan of each program.

- For programs where practical instruction is not possible through simulations, schools should use the blended learning model to facilitate laboratory and practicals.
- Credits score for mandatory experiential learning should be clearly articulated in the credit scheme of the Digital Education program.
- For programs requiring industry visits, schools should be encouraged to use virtual tours or videos to supplement experiential learning. To ensure usefulness and effectiveness, schools should produce short questionnaires, checklists, and quizzes at the end of the virtual tour or video to test the understanding.
- Programs requiring experiential learning through roleplays should be supplemented by interactive learning or video conferencing.

D. Evaluation & Assessment

Assessment and examination are an integral part of the teaching process to assure the wider community of the competence of the student in the field of study appropriate for that level.

The imperatives for evaluation and assessment for Digital Education are different from the conventional mode of delivery. Schools need robust, automated, secured, and integrated assessment systems to support students on Digital Education programs.

- There should be an explicit policy on Digital Education evaluation, assessment and examination, available to all stakeholders.
- Assessment approach for each program should require sign-off from the governing bodies,
- Assessments for the Digital Education program should remain consistent and in compliance with the semester examination policy of the schools.
- Schools should deploy multiple forms of evaluations and assessments including proctored examinations, assignments, quizzes, presentations, in-class activities, self-assessments, peer-reviews, and non-proctored examination.
- Examinations should be designed to test the application of knowledge rather than recalling memorized information considering their remote nature.
- To maintain and enforce academic honestly, schools should ensure that required precautions are in place to safeguard examination submissions against plagiarism and unpermitted collaboration.
- Schools should ensure that a grievance mechanism is in place to deal with any complaints about exam functionality, marking or technology malfunction.

Assessments for a Digital Education program can be broadly categorized as either 'formal/ summative' or 'informal/ formative'. The formative assessment generally provides tutors with the ability to gauge their students' comprehension of learning content and study support resources whilst, the summative assessment provides a systematic way to measure student progress and assign scores.

1. Formal/ Summative Assessment

i. Computer-Based Examination

Computer-based examination can be tested using 'objective' or 'subjective' type questions. Objective type questions are those that require a specific correct answer with no option to provide a new or different opinion whilst the subjective types are constructed response questions that require answers in the form of explanation, calculations, charts, graphs, diagrams, etc.

- Schools should have the option to proportionally create examinations using both, objective and subjective type questions for wider and more rigorous testing.
- Schools should use LMS to automate delivery for both types of computer-based examinations.
- Schools should ensure that examination timeline and duration policies are incorporated within the LMS delivering computer-based examination through subjective testing.
- Objective type questions may be auto-marked on LMS whilst subjective type questions should be marked using expert-markers.
- Any expert marking should be executed online using annotations or scoring areas.
- Schools should ensure that there is a sizeable question bank for computer-based examination available for more robust and fair testing.
- Schools should ensure that the question banks of computer-based examinations are refreshed periodically.
- Objective type examinations should contain a variety of question types including multiple-choice, fill-in-the-blank, true-false, drag-drop, matching, hot-areas, decision tree, etc.
- Subjective type examinations should contain a variety of response types including, word processing, spreadsheet, presentation, and on-screen annotations with an easy option to insert symbols, diagrams, charts and graphs for Science, Technology, Engineering, Mathematics (STEM) programs.
- There should be an equal mix of easy, moderate, and difficult questions.
- It should be ensured that the computer-based examination provides fair coverage of the syllabus for all students despite different questions and that each student receives a fair mix of descriptive and calculation-based questions.

ii. Offline Written Examination

Offline written examinations for a Digital Education program are usually open-book examinations where the examination is delivered through an exchange of email with limited or no proctoring. Therefore, these examinations are designed to test the application of knowledge with special precautions to safeguard against plagiarism and unpermitted collaboration.

- Any deadlines, formats, content, guidelines, and submission protocols should be shared with students in the student handbook and joining instructions.
- Students should be allowed to upload their offline examination through student portal on the LMS via secure login or via registered email ID to a dedicated mailbox adhering to clear identification protocols.
- It should be ensured that each submission is assessed on the automated plagiarism tools such as Turnitin before evaluation and grading.

2. Informal/ Formative Assessment

i. Online Quizzes, Tests, Surveys and Polls

Some schools use online quizzes, tests, surveys, and polls as modes of assessment. Quizzes should be conducted online using LMS or open-source quiz and survey applications. These should be made a part of the overall course assessment bearing credits and grades.

ii. Oral Examinations and Interviews

Some schools choose oral examination and interview as a mode of assessment. Oral examination and interview should be conducted using a live-online platform with set timetable and duration.

It should be ensured that all oral examinations and interviews are recorded and tagged to the respective student using LMS. A bank of questions comprising of easy, moderate and difficult questions should be developed in advance and a fair mix of these are asked at the oral examination or interview.

E. Examination & Reporting

1. Marking, Feedback and Performance Reporting

- Schools should ensure that an online marking and feedback system is available through LMS.
- Schools should be encouraged to introduce an on-screen marking application or develop guidelines for manual marking and uploading scripts and results.

- Schools should keep an electronic record of all examination results for individual students and batches for each Digital Education program being offered.
- Schools should ensure that examination results are delivered securely to students electronically using the student portal.
- Existing examination and result review policy should apply to online examinations.

2. Statistics

- Schools should collect useful insights from programs being offered through Digital Education. These should include statistics on student application for admission, merits, rejections, acceptances, participation and attendance, examination performance, pass rates, feedback scores, complaints, awards, and alumni, etc.
- The data and statistics should be used for reforms and quality assurance purposes.
- Schools should be encouraged to use their statistics for the marketing of their Digital Education programs.

3. Transcripts, Certificates and Degrees

- Institutes should be given an option to issue electronic transcripts and certificates however, the degree should only be issued on approved stationary with a seal and signature of the issuing authority.
- An automatic electronic signature may be added to electronic transcripts and certificates.
- Schools should be encouraged to develop a graduate directory and offer an online portal for verification and attestation of students' transcripts, certificates, and degrees.
- Schools should ensure that appropriate cybersecurity and data protection measures are in place to safeguard electronic transcripts and certificates from misuse.
- Students should be allowed to download and print their electronic transcripts and certificates using their student portal.
- Educational Institutes should be required to comply with existing policies on program accreditation, their equivalence on National Qualification Framework (NQF) and attestation of any certificates, transcripts, and degrees.

KidsLoop's Digital Education Revolution Program

KidsLoop- Digital Education Revolution.

The KidsLoop- Digital Education Revolution (KDER) is a proposal for a Government funded educational reform program. Through the program, the government would allocate ___Amount___ over __no.___ years to:

• Increase information and communication technology (ICT) proficiency for teachers and students throughout Pakistan to nourish the use of ICT in teaching and learning, through a well-rounded, all inclusive Teacher Training Program

• Support mechanisms that will assist schools in ICT deployment, including the integration of an all-in one LMS system, connecting the Ministry of Education to Schools, Teachers and students.

• Provide laptops to all public high school students through a National Secondary School Computer Fund

• Deploy high-speed broadband to all Pakistani schools and quality digital tools, resources and infrastructure including Smart LED Touch Screens to help support the National Curriculum

• Develop projects and research that will assist and support the use of digital tools in learning

• Enable parents to participate in their child's education through online learning and access

By the Year 2030, the government will have:

- Allocated total of have ___No._____ computers
- Trained a total of ____No._____ Teachers
- Integrated LMS software in ___%_____ of the schools
- Installed ICT Infrastructure in ____%_____ of the schools

The Strategy has been developed around four key themes:

Theme 1: ICT Infrastructure

Theme 2: Teaching, Learning and Assessment Using LMS Systems

Theme 3: Teachers Professional Training

Theme 4: Leadership, Research and Policy

Conclusion

Education is the most powerful lever for individual wellbeing, equality and economic growth. It is a fundamental element to elevate societies to a more prosperous future. Digitalizing education is helping enhance reach, develop skills, and ultimately enable the spread of education amongst the population.

Digital Learning can solve a lot of access and reach challenges for the education sector in Pakistan. However, policy measures should be taken to provide a quality assurance framework and support for the schools to offer a student experience that has academic value and supports wellbeing. There are several gaps in online education in addition to the perception challenges, which the national policy should address to reset national confidence in Digital Education.

When substantial number of schools in Pakistan start offering quality programs through Digital Education at a large scale, then competition and economic forces will start to kick-in making these programs more economical and of high quality. There is a greater need than ever to upscale the capacity of schools and their faculty in line with the need of the day.

Although technology is a powerful tool to address some of the challenges, in the end it only remains a tool – its actual impact is very much dependent on the quality of the content it helps to disseminate and on the quality of the education infrastructure it supports. Hence, the roadmap to digitalize the education sector highlights the important steps that must be taken by the Government to push forward the digitalization of the education sector in Pakistan. Scaling up the education initiatives mentioned in this report, which have been marked as key initiatives around the world, have the potential to reap large benefits for Pakistan.