

E-Governance in the Elementary & Secondary Education Department of Khyber Pakhtunkhwa

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Abstract

E-Governance in the Elementary & Secondary Education Department (E&SED), Khyber Pakhtunkhwa has emerged as a significant mechanism for reforming education administration by managing the public education system efficiently, transparently, accountably and with the help of technology. The use of Information and Communication Technologies (ICTs) has transformed traditional administration through the digital management of educational information, human resources, teacher deployment, school monitoring, attendance, communication, planning and service delivery. To enhance educational governance, KP has launched a number of initiatives under E&SED that include Education Monitoring Information System (EMIS), Human Resource Information System (HRIS), e-Transfer Policy, e-Filing, e-Notification, and e-Summary. These initiatives have facilitated access to real-time data, monitoring, administrative coordination, transparency, and evidence-based decision-making. However, effective implementation of e-governance still faces issues of digital infrastructure, connectivity, system integration, technical capacity and technological literacy. The review of existing e-governance initiatives, identification of key institutional and technological gaps and review of relevant practices at the national and international levels are discussed to develop context-sensitive policy recommendations. This adds to the existing literature on digital transformation in education by addressing practical ways for an efficient, transparent, responsive, inclusive and evidence-based educational governance system in Khyber Pakhtunkhwa.

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1. Introduction

World Bank defines governance as “The manner in which power is exercised in the management of a country’s economic and social resources for development while e-Governance has been defined as the use of information and communication technology by governments to enhance the quality of information in services provided to citizens, businesses, civil society organizations, and other government agencies in an efficient, cost effective and convenient manner, making government process more transparent, accountable and hence, strengthening democracy.

Technology progress in the 21st century has deeply influenced human life and led to electronic governance (E-governance). E-governance through Information Technology (IT) based technologies have permeated every government sector in the last three decades and its need is increasing day by day. E-governance is government-operated Information and Communications Technology ICT systems that promote public involvement, service delivery

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improvement, accountability, and transparency (World Bank, 2002). Citizens, providers, and governments are linked through technology in the service triangle and offers residents real-time services and information (SHARMA, 2014).

The Ministry of Science and Technology Pakistan established the Electronic Government Directorate (EGD) in 2002 when it realized ICT's importance and started investing in its expansion. In 2014, the Pakistani government proposed vision 2025, a strategy and road map to modernize governance and in 2018, Pakistan adopted its first Digital Pakistan Policy despite economic and social difficulties.

Khyber Pakhtunkhwa government realized e-Governance's importance and introduced digital transformation and developed Digital Policy 2018. Khyber Pakhtunkhwa Information & Technology Board (KPITB) was tasked with speeding up government digitization to increase innovation, transparency, and accountability. Investments were made to enhance internet access, governance, economy, and skills.

Elementary & Secondary Education Department (E&SED), Govt. of KP, being one of the biggest departments and comprising of attached departments, autonomous bodies and authorities, deals with establishments of 34,784 schools, 194,996 teachers, and 48,004 non-teaching employees to impart education (E&SED, 2025). Therefore, digital measures such as Education Monitoring Information System (EMIS), Human Resource Information System (HRIS), education monitoring mechanisms, e-Filing, e-Transfer Policy, e-Notification, e-Summary etc. were used to control the vast size of governance and to reduce human involvement in decision making. Education Monitoring Authority (EMA) was given the authority to monitor teachers' attendance, prepare authentic and real time data, and identify missing facilities using a digital monitoring system for making proper decision making and appropriate budgeting. During Covid-19, it was felt that the department lacked an online learning system and had connectivity and integration concerns horizontally and vertically. Directorate of EMIS was given specific attention to create an online digital learning opportunity to abridge the teaching & learning gaps. The E-Transfer policy introduced in 2019 improved openness and operational simplicity. Elementary & Secondary Education Foundation Khyber Pakhtunkhwa (ESEF KP) produced a small-scale model for digitizing KP's education sector. Despite all these measures, there remains a significant scope for further improvement in e-governance in E&SED KP.

The aim and objective of this study is to review the existing e-governance initiatives in the E&SED, analyze national and international best practices, and propose realistic policy recommendations for improving e-governance and enhancing service delivery.

2. Statement of Problem:

E-governance is widely recognized as a key initiative for improving service delivery, promoting citizen-centric approaches, ensuring transparency and accountability. While several effective e-governance models have been successfully implemented around the world, Pakistan still lags behind ranking 136th in the United Nations E-Government Development Index, 2024, as compared to Bangladesh which is at 100th and India being at 97th position. Despite introduction of various e-governance initiatives, the desired outcomes have not yet been achieved in Pakistan, particularly in Khyber Pakhtunkhwa (KP). This research presents an opportunity for the Elementary and Secondary Education Department (E&SED) to harness the potential of e-governance for greater impact and quality education. This study also seeks to critically review the existing e-governance initiatives in the E&SED, analyze successful national and international models, and propose practical policy recommendations to achieve meaningful and sustainable results.

3. Scope of study:

This research provides an overview of e-governance and highlights the existing gaps within the Elementary and Secondary Education Department (E&SED) of Khyber Pakhtunkhwa. It places particular emphasis on the role of systems such as Education Monitoring Authority (EMA), Education Management Information System (EMIS), and initiatives like Human Resources Management Information System (HRMIS), e-learning, school-based information systems, e-filing, e-transfer, and e-summary, which are claimed to exist within the department, but have rarely been critically examined.

This study focuses on evaluating the primary and secondary data sources, focused group discussions and existing initiatives in the Elementary and Secondary Education Department (E&SED) of Khyber Pakhtunkhwa.

4. Literature Review

Governance refers to the systems, processes, and practices through which decisions are made, authority is exercised, and organizations or states are managed and held accountable. Governance in education is about its guidance and accountability to ensure its quality. It includes setting policies, deciding how resources are used, ensuring teachers and schools deliver quality education, and making sure all children regardless of background have access to learning opportunities. Good governance also involves parents, teachers, communities, and students in shaping the way schools and education departments work.

With the rise of technology, e-governance in education has emerged as a way to make this management more efficient and transparent. E-governance is the use of ICTs in the field of public administration to improve managerial efficiency and effectiveness (Garcia, 2005). It uses digital tools like online data systems, mobile apps, and web portals to handle administrative tasks, track performance, and provide services directly to students, teachers, and parents. For example, online admissions, digital attendance systems, e-transfer of teachers, and real-time dashboards for school monitoring are all forms of e-governance. Traditional governance provides the rules and structure, while e-governance adds speed, openness, and accountability through technology. Together, they can make the education system more responsive, inclusive, and effective for students and communities.

United Nations measures the important dimensions of digital governance i.e. telecommunication infrastructure, human capacity and provision of online services of the member states. Denmark ranked 1st in the E-government Development Index (EGDI) followed by Estonia, Singapore ranked 3rd, India ranked 97th (top in South Asia), followed by Bangladesh at 100th whereas Pakistan ranked 136th in the same index in 2024 (United Nations, 2024).

Education systems everywhere are under pressure to become more transparent, efficient, and responsive. In Pakistan, the National Education Policy (2017–2025) highlights technology as a key driver of education reform, while the 18th Constitutional Amendment gives provinces like Khyber Pakhtunkhwa (KP) the authority to shape their own education strategies. Building on this, the KP Digital Policy (2018) and the Education Sector Plan (2020–25) both stress the role of digital systems in improving school management, teacher accountability, and service delivery. These policies give the Education Minister's Task Force a strong foundation to push forward with e-governance reforms.

In KP several digital tools are already in place like Education Management Information System (EMIS) that collects and manages students, school, and teachers' data. HR systems like HRMIS and e-Transfer portals make teachers postings and transfers faster and more transparent. Citizen-facing portals allow parents, students, and communities to access

information or lodge complaints online. These initiatives show that KP is serious about using technology to tackle long-standing governance challenges in education.

However, challenges are there as all areas do not have reliable internet or digital literacy, and schools often face resistance to new systems. Cybersecurity and long-term sustainability of these technologies are also concerns.

Since its inception, Pakistan's education sector has received a budget allocation of about 2 percent, including 0.5 percent for higher education. Since the system's infrastructure, resources, and capacity cannot be expanded to match the urgency of the crisis, the difficulty must be managed within the current system (Butt D. S., 2022).

Several issues that are prevailing in KP are digital divide of less access to technology in rural schools and marginalized communities, staff with limited IT skills, and sustainability of the projects.

Unlike KP, Punjab's e-governance programs, such as digital land records and service portals, offer useful lessons. They show the value of phased rollouts, user-friendly mobile apps, and clear monitoring systems. At the same time, Punjab's experience also highlights the importance of building awareness among citizens and redesigning bureaucratic processes not just installing new software.

The current study deals with the gaps in e-Governance in addressing the issues in student learning outcomes, to facilitate marginalized groups and to recommend ways which can make the e-Governance projects financially sustainable in the long run.

5. Research Methodology

A mixed method approach containing both qualitative and quantitative methods has been adopted for this research. Primary and secondary data were obtained from different sources. To collect primary data, survey through google form-based questionnaire was used to collect data from education managers and stakeholders at district level and school heads at school level of E&SED, BISE Peshawar, EMA and ESEF.

In-depth unstructured and semi-structured interviews were conducted with stakeholders including secretary, special secretary, additional secretaries, Director EMIS, Chairman BISE Peshawar and Districts Education Officers, working in Elementary and Secondary Educations Department, KP. Similarly, Senior officials of the Reforms and Implementation Wing (R&I), KPIT Board, Education Monitoring Authority, and Elementary and Secondary Education Foundation were consulted. Focused Group Discussions (FDGs) were held with officials concerned and official documents were perused to acquire accurate data. Similarly, secondary data was acquired from reports and other sources available online and in hard.

A detailed study of the e-governance strategy and practices of digitalization in UK, India and Punjab were also reviewed and compared with e-Governance initiative of KP. The data was properly transcribed, translated and thematically analyzed. Also, computer software was used to analyze the quantitative data that had been collected through surveys.

6. Situational Analysis

The introduction of e-governance in Pakistan, particularly in KP, has become a pressing necessity. According to the 2023 Census, an alarming 25.37 million school-aged children are out of school across the country, including approximately 4.92 million in KP alone. Implementing an efficient e-governance framework in the education sector offers a promising pathway to expand access, improve management, and enhance service delivery for millions of out of school children.

The Elementary and Secondary Education Department E&SED KP is one of the largest departments of the province, managing an extensive network of more than 34,800 educational institutions and employing over 243,000 teaching and non-teaching staff (E&SED, Govt. of KPK, 2025).

The department functions through three directorates i.e., Directorate of Elementary and Secondary Education, Directorate of Curriculum and Teachers Education (DCTE) and Directorate of Professional Development (DPD). Additionally, eight (08) autonomous Boards of Intermediate and Secondary Education (BISEs) are empowered to conduct SSC and HSSC examination throughout the province are operating under the administrative control of E&SED. Other autonomous bodies under the same departments include:

- A. Education Monitoring Authority (EMA)
- B. Textbook Board (TBB)
- C. Elementary and Secondary Education Foundation (ESEF)
- D. Merged Area Education Foundation (MAEF)
- E. Private Schools Regulatory Authority (PSRA)
- F. Nine Cadet Colleges and 20 Model autonomous Institutions

The E&SED has launched 36 major e-governance initiatives in the education sector including: Development of integrated Education Management Information System (EMIS), Human Resource Management Information System (HRMIS), and Student EMIS, E-Transfer Policy and E-Notifications, Online attendance monitoring and digital labs, Online document verification portals, On-screen marking system for examinations and so on.

These initiatives represent a significant step towards modernizing the education sector, improving service delivery, transparency, accountability and strengthening governance mechanisms. A brief description of each entity and their respective digitization initiatives is provided below:

6.1 Directorate of Elementary and Secondary Education (E&SE)

This directorate is the operational backbone of the department, overseeing over 34,800 school administration, HR management, and service delivery. The implementation of HRMIS and e-Transfer Policy has reduced favoritism and political interference in teacher postings.

6.2 Directorate of Professional Development (DPD)

This directorate is responsible for teacher training and capacity building which develops digital training modules and e-learning platforms that has increased outreach especially during Covid-19. Data-driven insights from HRMIS help identify training needs.

6.3 Directorate of Curriculum and Teachers Education (DCTE)

The Directorate of Curriculum and Teachers Education (DCTE) is responsible for developing and updating curricula, teacher guides, and textbooks. In recent years, the directorate has also focused on adopting digital content development and ensuring electronic dissemination of curricula and related resources. Efforts are being made to integrate its work with the Textbook Board to provide digitized access to textbooks.

6.4 Boards of Intermediate and Secondary Education (BISEs) – Peshawar & Kohat

The Boards of Intermediate and Secondary Education (BISEs) in Peshawar and Kohat play a key role in managing examinations, assessments, and certifications for students. In recent years, they have taken important steps of online enrollment and result services toward e-governance, making the system more efficient, transparent, and student-friendly.

6.5 Educational Foundations (ESEF & MAEF)

These foundations promote access to education through public-private partnerships and community-based schools. These foundations use digital databases for partner schools and scholarship tracking which helps in improved monitoring of contract schools through online reporting.

6.6 Education Monitoring Authority (EMA)

The Education Monitoring Authority (EMA), formerly known as the Independent Monitoring Unit (IMU), represents one of the most significant initiatives of the provincial government. Its primary objectives were to strengthen service delivery and ensure real-time accountability

through an online monitoring mechanism. In its initial phase, the system functioned effectively: teacher attendance improved, and budget allocations were made to address missing facilities. However, during interviews, officials emphasized that the Authority now requires substantial reforms to align with modern e-governance initiatives. The IT infrastructure has become outdated, and the legal framework needs revision and integration to support evolving requirements. Furthermore, accountability gaps persist due to the absence of an appropriate forum at the Directorate and Secretariat levels. Consequently, teachers in BS-16 and above remain outside effective accountability mechanisms, unlike those below BS-16 who are monitored through District Scrutiny Committees (DSCs) chaired by Deputy Commissioners.

The officers further underscored that comprehensive skill development of the existing staff is essential. Without equipping personnel with the necessary technical and managerial competencies, the intended objectives of e-governance in the education sector cannot be fully realized.

6.7 Private Schools Regulatory Authority (PSRA)

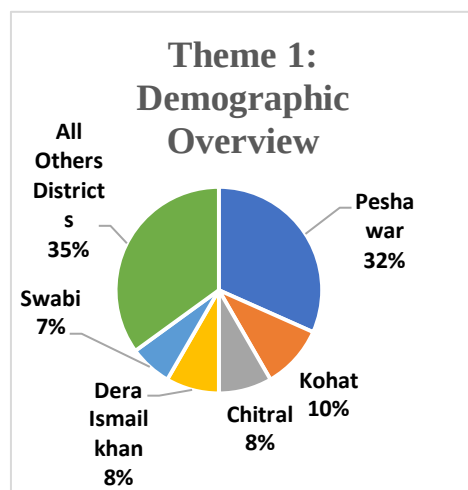
The Private Schools Regulatory Authority (PSRA), functioning as a subordinate office of the Elementary and Secondary Education Department (E&SED) Khyber Pakhtunkhwa, has adopted partial online facilities which include online applications submission, online payment, and online dispatch of registration certificates which has reduced paperwork to a great extent. However, the majority of its services continue to operate under manual and traditional methods. According to Clause 27(2) of the PSRA Regulations, the Authority is empowered to conduct all other functions manually. During consultations, the Deputy Director and Assistant Director of PSRA highlighted that without amendments to the existing legal framework, the Authority cannot transition fully to an online system. This underscores the critical importance of updating the relevant laws and regulations as a prerequisite for the effective introduction of e-governance within PSRA. (FGD, DD & AD PSRA, 13-09-2025)

6.8 Analysis of Survey and Findings

A web-based questionnaire was developed and circulated among key stakeholders including parents, students, and teachers to assess the current state of e-governance in the E&SED of KP. The survey specifically explored stakeholders' perceptions and experiences regarding awareness, transparency, accessibility, accountability, digital skills, and the availability of IT infrastructure. The findings from this survey are summarized and presented in the following graphical illustrations:

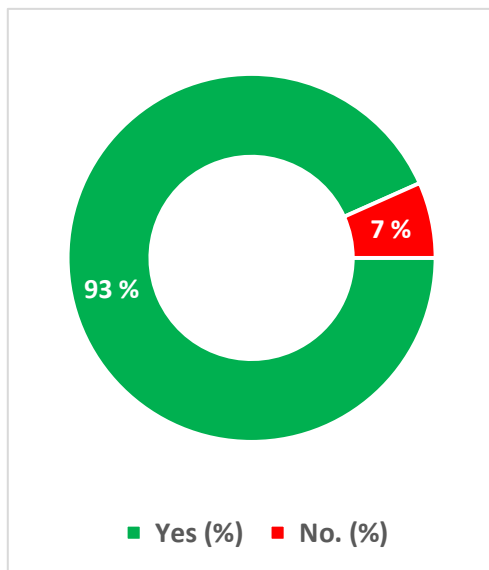
Theme 1: Demographic Overview

Most responses came from Peshawar (19), reflecting its status as the provincial capital and most populous district. However, there was also meaningful participation from Kohat (6),



Dera Ismail Khan (5), and Chitral (6), showing that interest in e-governance extends beyond the capital. The data was gathered through a 12-question Google Form survey, allowing for structured and accessible feedback from diverse stakeholders.

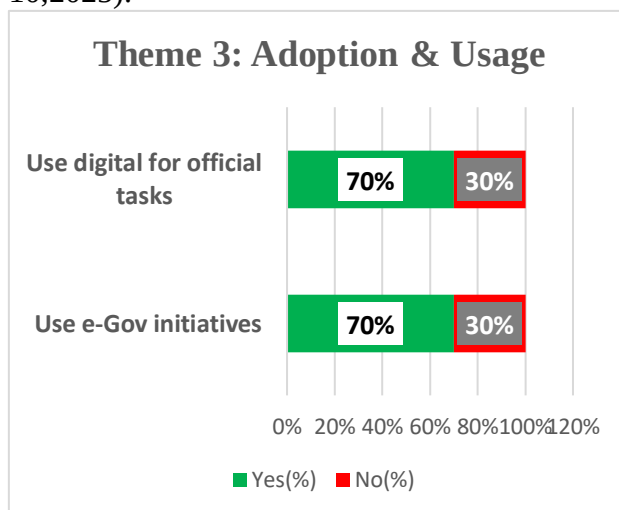
Theme 2: Awareness & Familiarity The following figure shows that 93% of respondents are familiar with the concept of e-Governance, showing that the general principle is well understood across the education sector in KP. Director E&SE and DEOs during interview responded that almost all mentioned specific tools (EMIS, HRIS, IPMS, biometric attendance, e-transfer), are being practically and effectively used (interview of director & DEOs, Sep 10, 2025).



Theme 3: Adoption & Usage

The analysis shows a consistent adoption trend, with 70% of respondents using e-Governance initiatives and 70% using digital tools in official tasks. Only 30% of participants reported non-usage in both areas, indicating steady integration of digital practices in daily operations.

Deputy Director and DEOs (male, female) of Education Department KP showed high adoption (e-transfers, digital pensions, FEMIS), and also informed during interview that remote districts face connectivity and literacy issues (Deputy Director, DEOs (M/F), Sept 10, 2025).

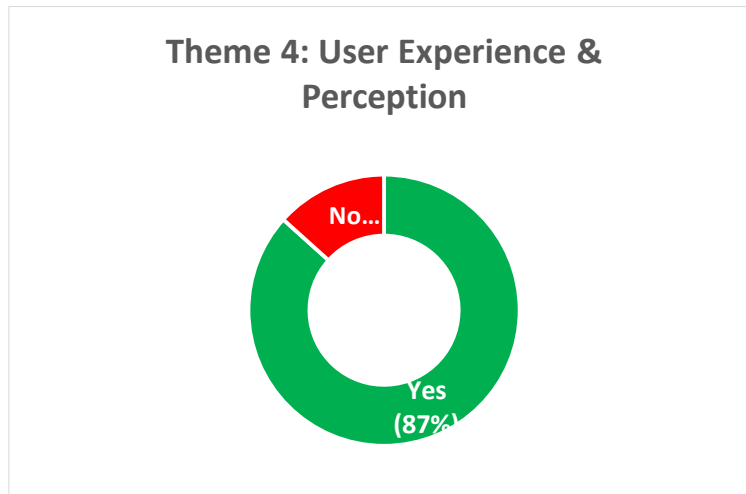


Theme 4: User Experience & Perception

A vast majority (87%) of respondents found the e-Governance system user-friendly, while only 13% did not share the same view.

This strong positive response indicates that the system's design and usability are well-received, enhancing overall acceptance and effectiveness of e-Governance initiatives.

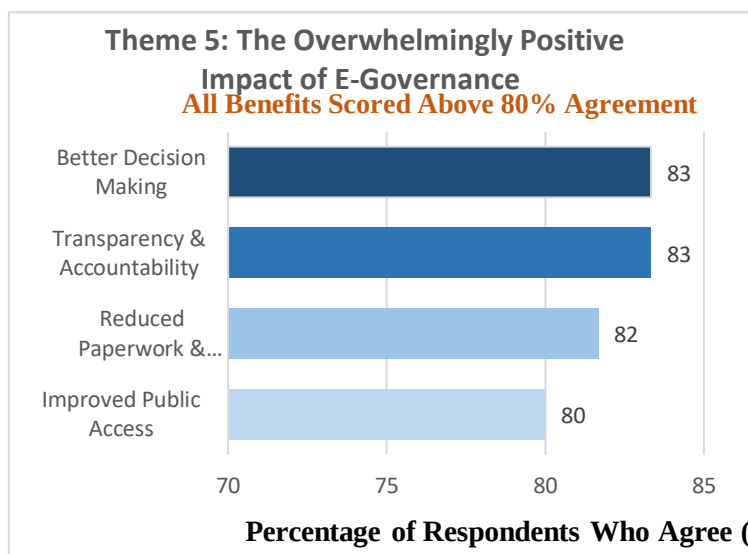
Most of the officers during the interview highlighted that introduction of e-Governance improved efficiency and transparency and reduced paperwork. (AS R&I, Sep 10, 2025).



Theme 5: Overwhelmingly Positive Impact

Over 80% of respondents expressed confidence in e-governance, citing major gains in decision-making, transparency, and accountability (83% each). Efficiency has improved through reduced paperwork (82%) and public access to services has expanded (80%), confirming that e-governance is delivering tangible results.

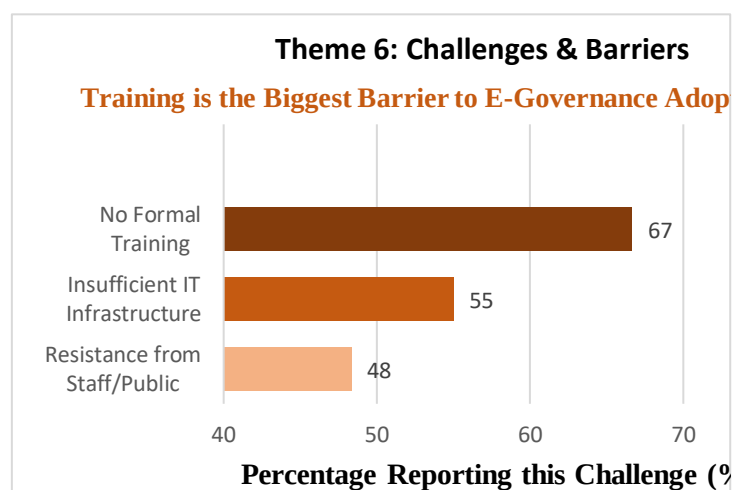
The Director EMA and the DMO EMA Mansehra, KP during a focused group discussion, highlighted that the establishment of the EMA and the introduction of online monitoring have reduced absenteeism (through biometric/IPMS), enabled better planning (via EMIS dashboards), and facilitated real-time monitoring.



Theme 6: Challenges & Barriers

Despite positive outcomes, significant hurdles remain. A lack of training is the most critical barrier, with 67% reporting no formal guidance on using e-governance tools. Inadequate IT infrastructure—including computers, internet, and power backup—was cited by 55% of respondents, while 48% noted resistance from staff or the public.

All officers of the E&SED, including the Director EMIS, Director EMA, and all DEOs (Male/Female), clearly stated that the major challenges to implementing e-governance include a shortage of IT staff, weak internet connectivity (especially in remote areas), resistance from clerical staff, funding constraints, lack of awareness among parents, and the absence of a legal framework (Director EMA, Sep 10, 2025)



7. Impact Assessment

E-governance initiatives in KP education sector aim to modernize administration, improve service delivery, and strengthen citizen trust. Their impact can best be understood by examining four core dimensions: efficiency, transparency, accessibility, and user satisfaction.

7.1 Efficiency

The introduction of digital platforms such as EMIS, HRMIS, and the Student EMIS has streamlined routine administrative work and data of teachers and students are readily available. Major tasks like teacher transfers, student enrollment, and exam processing are now faster and less prone to duplication and other complications. Online result publication and on-screen marking have shortened examination cycles, ensured transparency, and reduced the burden on Boards of Intermediate and Secondary Education (BISEs).

However, it has been observed that the benefits are not uniform. Many directorates and schools continue to rely on old traditional systems creating bottlenecks for smooth introduction of e-Governance. Schools of far-flung areas with poor internet connectivity gain little from digitization, and low digital literacy among teachers also affects implementation of e-Governance. Overall, efficiency gains are clear, but conditional where systems are fully integrated and staff trained, the improvements are significant, but province-wide results are diluted by uneven adoption.

7.2 Transparency

Digital processes have reduced the scope for discretionary changes and malpractices. Online enrollment, e-notifications, on-screen marking, and automated transfer policies have created audit trails, built credibility and reduced avenues for favoritism and nepotism. The introduction of public portals for registration and verification have further minimized the need for face-to-face interactions which are traditionally linked to corruption risks.

It has also been observed that transparency remained partial because some districts and affiliated bodies are still not fully integrated, and weak data governance and cybersecurity practices pose new risks day by day. Thus, while the potential is strong, its full realization depends on common standards, better oversight, and secure systems. However, the current status of e-Governance initiatives has optimally reduced the avenues of corruption.

7.3 Accessibility

The introduction of e-Governance has indeed made life easier for the common man because some many important everyday tasks are now easily accessible online. Like digital training modules, e-content, and online portals have widened access, particularly benefiting teachers in urban areas and families seeking quick registration or document verification. These services reduce travel time, unnecessary expenses and administrative burdens for many users.

It has also been observed that the digital divide persists as rural and tribal districts often lack reliable internet connectivity, updated devices, or the digital literacy required to benefit from these services. Without localization of content and user-friendly design, marginalized groups risk being left behind. Consequently, accessibility outcomes are mixed: urban communities see significant gains, while remote and vulnerable groups experience little change.

7.4 User Satisfaction

It has been found that where initiatives of e-Governance function smoothly, users i.e. teachers, students, parents, and administrators report greater satisfaction. The benefits include faster exam results, quicker and transparent transfers, and online verifications. Importantly, on-screen marking and digital transfers are perceived as fairer, therefore enhancing trust in institutions.

At the same time data privacy, integration of system, IT training of staff and sustainability of resources and cybersecurity shall be considered with priority by the authorities in order to extend satisfaction to the users and durability to the initiatives of the e-Governance.

8. Institutional and Policy Framework Evaluation

The Elementary and Secondary Education Department (E&SED) comprises of three directorates, a number of autonomous bodies, and specialized authorities. Both the administrative department and its attached formations have introduced their own e-governance mechanisms, such as Education Management Information Systems (EMIS), dedicated IT wings, and related initiatives.

Within the E&SED Secretariat, the EMIS Wing serves as the focal unit for digital transformation and e-Governance initiatives. It is headed by a Director (BS-19), supported by a Deputy Director and technical staff. Over time, the wing has developed more than 30 e-governance solutions, including the Human Resource Management Information System (HRMIS), School Staff Reporting (SSR), e-Transfer system, Asset MIS, and Student MIS. In addition, reforms such as e-Summary, e-Filing, and e-Note are currently being piloted to streamline internal workflows and decision-making within shortest possible time.

Despite these innovations, several institutional challenges remain in the smooth implementation of e-Governance in education sector. The EMIS Wing has neither received a dedicated budgetary allocation nor have its technical resources and equipment's been systematically upgraded. Shortages of qualified human resources and lack of system integration across units hinder the smooth implementation of digital initiatives. Moreover, weak coordination between departments and academia has limited the effective utilization of the vast amount of data already available.

At the same time, attached bodies such as the Elementary and Secondary Education Foundation (ESEF), KP Boards of Intermediate and Secondary Education (BISEs), Merged Area Education Foundation (MAEF), the Private Schools Regulatory Authority (PSRA), and other autonomous institutions have established their own e-governance arrangements. These efforts have undoubtedly improved transparency, enhanced accessibility and reduced

recurring expenditures on stationery. However, the lack of interlinkages between these initiatives means that the overall impact of e-governance in the sector has remained fragmented. The isolation of these systems has prevented the province from fully realizing the intended efficiency, integration, and citizen-centric service delivery that e-governance promises.

9. Legal and Policy Framework:

The following legal framework is prevalent in KP:

Existing Acts and Rules of E&SED, KP

Title of Act / Rule / Ordinance	Year of Enactment	Key Points / Purpose
Khyber Pakhtunkhwa Free Compulsory Primary and Secondary Education Act	2017	Makes primary and secondary education free and compulsory; obligates government to ensure access to basic schooling for all children aged 5–16.
Khyber Pakhtunkhwa Private Schools Regulatory Authority (PSRA) Act	2017	Establishes PSRA to register and regulate private schools, standardize fees, ensure quality education, and monitor compliance with regulations.
Khyber Pakhtunkhwa Education Monitoring Authority (EMA) Act	2019	Creates EMA as an independent body to monitor teacher attendance, assess school facilities, and provide real-time data for decision-making and accountability.
Khyber Pakhtunkhwa Teachers (Appointment and Regularization of Services) Act	2022	Provides legal framework for recruitment, appointment, and regularization of teachers in E&SED; ensures merit and transparency.
Khyber Pakhtunkhwa School Bags (Limitation of Weight) Act	2020	Sets limits on the weight of school bags to protect children's health; instructs schools to reduce unnecessary load on students.
Khyber Pakhtunkhwa Supervision of Curricula, Textbooks and Maintenance of Standards of Education Act	2011	Provides legal cover for curriculum development, textbook approval, and ensuring minimum educational standards in schools.
Elementary and Secondary Education Foundation (ESEF) Ordinance	2002	Establishes ESEF to promote access to education through public-private partnerships, community schools, and scholarships.

Employees of E&SED (Appointment & Regularization) Act	2017 (Amended 2018)	Regulates appointment and regularization of E&SED employees, converting contract staff to permanent positions under defined criteria.
Registration and Functioning of Private Educational Institutions Ordinance	2001	Lays down rules for registration, inspection, and regulation of private educational institutions in KP.
Promotion of Regional Languages Authority Act	2012	Promotes and preserves regional languages in education, including curriculum and textbooks where applicable.

However, the above Acts, Rules, and Regulations contain no specific provisions that provide legal cover for the existing e-governance initiatives of the E&SED or its subordinate offices. Recognizing the transformative role of ICT, the Government of Khyber Pakhtunkhwa (KP) has introduced several landmark initiatives. These include the Digital Policy 2018, Good Governance Strategy 2019, KP Web Portal and Open Data, Ikhtiar Citizen Portal, Integrated IT Portal 2025, Digital Workspace 2023, e-Summary 2025, Digital Vision 2030, and the Paperless Project, among others.

In line with these broader provincial reforms, the Elementary and Secondary Education Department (E&SED) has introduced its own set of e-Governance initiatives, most notably the e-Transfer Policy. Furthermore, specialized ICT wings have been established within the department and its autonomous bodies to support and expand digital governance. However, despite these strides, a critical gap remains: there is no comprehensive legislative or legal framework to institutionalize e-Governance in E&SED. This absence of robust legal backing threatens the sustainability and durability of ongoing reforms, leaving them vulnerable to policy discontinuity, administrative resistance, and lack of enforceability.

10. Comparative Benchmark Of E-Governance with UK

The United Kingdom has made significant progress in integrating e-governance into its school education system. Digital platforms are extensively used for school management, student data tracking, teacher performance evaluation, and resource allocation. The Department for Education (DoE) provides centralized online portals for admissions, funding, performance tables, and safeguarding compliance. Learning management systems, digital assessments, and real-time reporting tools are integrated across schools, ensuring transparency, accountability, and evidence-based decision-making. Moreover, partnerships with private tech providers and academia continuously strengthen data-driven policy reforms.

11. Comparison with Khyber Pakhtunkhwa's E&SED

By contrast, the Elementary and Secondary Education Department (E&SED) in Khyber Pakhtunkhwa has taken initial steps towards e-governance, but remains largely reliant on traditional methods. Platforms such as PSRA and EMA introduced online facilities for registration, monitoring, and accountability, but their scope is limited due to outdated IT infrastructure, fragmented legal frameworks, and insufficient integration with EMIS. Unlike the UK, where data flows seamlessly between institutions for policymaking, KP's systems operate in silos, reducing their effectiveness. Moreover, gaps in capacity-building and the absence of robust accountability mechanisms further constrain progress.

12. Comparative study of e-Governance (India and KP)

India's digital education demonstrates how a strategic mix of policy, infrastructure, and innovation can drive large-scale transformation. Several lessons can be adapted to strengthen KP's education digitization journey:

Virtual Labs for Science Education

India has introduced Virtual Labs (2009) and OLABs (2014) provided cost-effective alternatives to physical labs, reaching students in underserved areas. With only 3,079 labs for 6,969 schools, KP faces a deficit of 3,890 labs requiring Rs. 15.5 billion (KPEMA, 2022). Adopting an OLABs-type model could immediately bridge this gap, giving students access to virtual experiments via smartphones and tablets.

Unified Digital Platforms

India has platforms like DIKSHA, SWAYAM, and PM eVIDYA consolidated content delivery across states, languages, and media (TV, radio, apps). In KP, a single integrated digital education portal should be developed to host e-content, online courses, teacher training modules, and assessments ensuring uniform access and reducing duplication across directorates. The already available e-lab and e-class initiated at ESEF KP may be extended to the whole province.

Inclusivity and Accessibility

In India special content was created for differently-abled learners (audio, video, QR-coded books, podcasts), ensuring equity in digital education whereas in KP no such facility exists.

Public-Private Partnerships (PPPs)

India has collaborated with private ed-tech companies under NDEAR facilitated scalable, reconfigurable, and innovative ICT solutions. In KP Strategic PPPs can provide technical expertise, digital content, and training support while keeping policymaking and data frameworks under government control. The MoU with 'NOON' academy and Science Technology English and Mathematics (STEAM) program and other AI based apps should be materialized and expedited.

Teacher Capacity Building

In India teachers training is embedded into ICT initiatives, supported by the UNESCO ICT Competency Framework. In KP teachers must be trained as digital facilitators, not just content deliverers. Training should focus on ICT pedagogy, online assessments, and blended learning models.

Resilience through Multi-Channel Delivery

In India E-learning content is delivered through TV channels, community radio, mobile apps, and MOOCs ensuring learning continuity during disruptions (e.g., COVID-19). In KP multi-model delivery systems (TV, radio, mobile, offline content sharing) should be developed to ensure education continuity in emergencies such as pandemics or natural disasters.

13. Comparative Bench Marking — E Governance in Education:

PUNJAB VS KP (E&SED)

Category	Punjab (School Education Dept. + PITB)	Khyber Pakhtunkhwa (E&SED + KPITB)
Budget & Resources	Large, sustained ICT budget; PITB well-resourced with technical HR.	Smaller budget, limited technical HR; ICT initiatives largely project-based.
Student Assessment	Low-cost IT-based assessments (2015); 5 million MEA tests; frequent and scalable.	Limited; no province-wide low-cost frequent assessment program.

School Monitoring	SBIS (2017): tablets, real-time reporting, attendance tracking, SMS alerts.	No province-wide SBIS equivalent; monitoring largely manual.
Examination Systems	Automated large-scale exams; PEC software for registration, question DB, error reduction.	No comparable large-scale automated exam system in place.
Digital Learning	Smart labs, tablets, LEDs, digitalized content (grades 6–10), online/offline video lectures.	Early Age Programming pilot; limited scale, parked in E&SED; lacks comprehensive digital content initiative.
Admissions	Online college admission system integrated with BISE; centralized, transparent, cost-reducing.	No province-wide online admission system for schools/colleges.
Teacher HR Services	e-Transfer (QR-coded), e-Retirement, Online ACR for performance evaluations.	Lacks province-wide automated HR services; transfers/retirement largely manual.
Youth & Innovation	Tech Hub, e-learning expansions, continuous political backing.	Durshal innovation hubs, Freelancers Awards, Youth Employment Programs; more focused on tech ecosystem than school education.
Political Support	Consistent across successive governments; PITB as innovation hub.	Inconsistent; dependent on project cycles and administration priorities.
Transparency Gains	Clear reductions in corruption via e-transfer/e-retirement; faster admissions/exams.	Limited impact; pilots not scaled, hence less systemic transparency gains.
Regulatory Framework	Punjab's School Education Dept. works in close coordination with PITB, backed by provincial legislation and budgetary approvals; formalized through Digital Punjab policies ensuring continuity and legal cover.	KP E&SED operates under general provincial ICT and education policies; lacks a dedicated legislative framework for e-governance in schools; dependence on KPITB MoUs and project-based arrangements reduces sustainability.

14. SWOT Analysis

14.1 Strengths of E&SED:

One of the most significant strengths of e-governance in the Elementary and Secondary Education Department is the introduction of the Integrated Education Management Information System (IEMIS). Through this system, several core functions have been digitized, making processes more transparent and efficient. For example, the e-transfer module automatically highlights vacant teaching positions across the province and facilitates merit-based postings, reducing manual delays and favoritism. Similarly, the digital linkages between the main Secretariat and District Education Offices (DEOs) have streamlined communication, ensuring that instructions, reports, and updates are shared in real time.

A notable example of successful e-governance integration is the Education Monitoring Authority (EMA), which employs digital tools to track teacher attendance and monitor the availability of facilities and staff, particularly in remote areas. Similarly, the Boards of Intermediate and Secondary Education (BISEs) have digitized several core services, including admission forms, fee submission, and student migration processes. The introduction of online systems for on-screen marking and invigilator appointments has not only reduced the financial burden on students but also promoted greater transparency in examinations.

In parallel, initiatives such as the introduction of e-Labs and e-Classes by the Elementary and Secondary Education Foundation (ESEF), along with the digital distribution of textbooks by the Textbook Board, have improved both accessibility and transparency. Importantly, the availability of extensive datasets through the Education Management Information System (EMIS) and other attached and autonomous bodies represent a major institutional strength of the education sector. Collectively, these reforms have enhanced internal efficiency and created more user-friendly processes for students, parents and teachers across Khyber Pakhtunkhwa (E&SED & BISE Peshawar, 2025).

14.2 Weaknesses of E-Governance in KP's E&SE Department

Lack of dedicated funding: There is no separate budget line or financial allocation for e-governance initiatives. This has led to operational difficulties and challenges in sustaining or expanding the system.

Absence of legal framework: During interactions with senior officials of the education sector, it was highlighted that there is currently no dedicated act or comprehensive regulatory framework to formally institutionalize e-governance initiatives. This absence of legal backing creates a structural vacuum, leaving reforms dependent on administrative discretion and vulnerable to policy reversals.

Limited technical capacity: Across most departments, many officials lack the digital and technical knowledge required to operate these systems effectively, which undermines performance and efficiency.

Resistance to change: At the departmental level, some employees have shown reluctance or resistance to adopting modern technology slowing down implementation.

Uneven progress across departments in Education Sector: While the Elementary and Secondary Education Foundation (ESEF) and the Boards of Intermediate and Secondary Education (BISEs) have introduced several notable e-governance initiatives, the Directorate of Curriculum and Teacher Education (DCTE) and the Directorate of Professional Development (DPD) appear to be lagging behind in adopting similar reforms.

Gaps in the e-transfer policy: According to senior officials of the education sector, the current e-transfer policy still requires intelligent refinements to address certain administrative grey areas in the best interest of students.

14.3 Opportunities of E-Governance in KP's E&SE Department:

Scaling up existing systems: The success of iEMIS, e-transfer and EMA monitoring show that digital reforms can work. There is a clear opportunity to expand these platforms further to cover more functions such as student performance tracking, school inspections and digital teacher training.

Improving service delivery for citizens: With the introduction of e-payments, e-classes and the digitization of core services such as admissions, fee submission, and student migration by the BISEs, there is considerable potential to further transition towards fully online service delivery.

Strengthening accountability: Real-time monitoring tools, especially those used by EMA and e-payments can be scaled across all districts to ensure payment transparency and teachers' presence, timely reporting and performance checks, leading to better service delivery in remote areas.

Policy and legal development: The absence of a legal framework creates a chance to draft a dedicated e-Governance Act/Regulation for the education sector. This would institutionalize reforms, protect investments and ensure continuity across governments.

Capacity building and change management: The gap in digital skills among staff highlights an opportunity to design targeted ICT training programs, orientation workshops, and incentives to encourage adoption of technology within the department.

14.4 Threats of E-Governance in KP's E&SE Department

Legal Cover Risks: At present, e-governance initiatives in the education sector lack a strong legal and regulatory foundation. This absence of formal backing leaves these reforms vulnerable to administrative discretion and frequent policy shifts which in turn threatens their continuity and long-term durability.

Financial sustainability risks: Without a dedicated budget, the entire system risks stalling or collapsing if donor funding or ad hoc allocations are withdrawn.

Resistance to adoption: Reluctance among staff to embrace new systems of latest AI can slow implementation and undermine efficiency gains, especially if change management is not handled properly.

Digital divide in access to services: While urban students and teachers may benefit from digitized services, those in rural or remote areas risk being left behind if internet and digital literacy gaps persist.

Partial digitization leading to inefficiencies: Incomplete processes (like revised DMCs in BISE) can create frustration among end users, reduce trust in e-governance systems and push citizens back towards manual, informal routes.

Policy design flaws: Weaknesses in the e-transfer policy, such as ignoring subject-specific needs, could result in poor teacher deployment, weakening the credibility of digital reforms.

Existing IT Infrastructure: For e-governance initiatives in the education sector to be effective and sustainable, there is a pressing need to extend reliable internet connectivity and upgrade outdated IT equipment.

15. PESTEL Analysis

15.1 Political Dimension

The provincial government has a keen interest in digitization, and has launched systems like IEMIS and e-transfer. However, political instability or frequent changes in administration can threaten the continuity of reforms. Another challenge is the absence of a formal E-Governance Act, which leaves the system vulnerable to policy shifts. Many initiatives are donor-driven, which can also create dependency rather than long-term political commitment.

15.2 Economic Dimension

E-governance has enabled the KP Government to save both time and money in KP's education sector. Tasks like teacher transfers, student enrollment, and exam management are done swiftly and costily processes like paperwork and other manual processes are being replaced by digital systems. These reforms also help the government spend money more wisely by showing exactly where facilities or resources need to be allocated. However, there are still issues as the education budget is still small, which threaten the sustainability of these reforms. Punjab Government has a permanent and well-funded IT setup, while KP often runs its projects on temporary budgets, leaving them vulnerable if funds dry up.

15.3 Social Dimension

E-Governance has contributed vastly to the social front, and has made education more transparent and accessible. It has enabled the parents to verify documents online, teachers transfer is handled more justly, and examination results are available much more quickly. Digital platforms played a lifesaver role by providing uninterrupted and smooth learning and teacher training during Covid 19.

However, it has been observed that the digital divide is a big concern. Children and teachers in rural or tribal areas still struggle with poor internet availability and lack of devices. Many teachers also lack the digital skills needed to fully benefit from online systems. These risks leave behind the communities that need the most support.

15.4 Technological Dimension

KP has introduced a long list of digital tools ranging from teacher management systems to real-time monitoring AI apps and online exam marking. These have boosted efficiency and reduced favoritism and nepotism. However, many directorates still use old, unconnected systems, meaning the benefits aren't reaped everywhere. KP also lacks the strong technical teams that Punjab enjoys through PITB, and cybersecurity risks remain real as more student and teacher data goes online.

15.5 Environmental Dimension

E-Governance has contributed hugely to the environment. By reducing paperwork, travel for official tasks, and administrative overhead, e-governance has helped cut waste and carbon emissions. However, more digital systems also mean greater demand for electricity and the problem of electronic waste when devices become outdated. Without a recycling plan, today's tech solutions could become tomorrow's environmental challenges.

15.6 Legal Dimension

KP has taken bold steps by aligning its reforms with national policies like the Digital Policy 2018 and Vision 2030 which provides direction and legitimacy to the reforms. However, unlike Punjab, which has a strong legal framework through the PITB Act and Digital Punjab policies, KP's reforms mostly rely on administrative orders and short-term projects. This means they can easily be slowed down or even reversed with a change in government or leadership. To make progress permanent, KP needs strong legal cover for e-governance in education

16. Gap Analysis of E-Governance in E&SED

Area of Gap	Observed Weakness / Challenge	Focus Area	Recommendations	Timeline
Digital Divide	Remote schools lack internet, electricity, devices; low teacher/student access	Equity & Access	Expand connectivity projects, provide device grants, localized e-content	Long Term (3–5 yrs)
Environmental Sustainability	No e-waste recycling plan; increased electricity needs	Green ICT	Introduce eco-friendly recycling policy & adopt solar-powered ICT labs	Long Term (3–5 yrs)
Legal Framework	No dedicated Act/regulation for E-governance in E&SED; reforms vulnerable to reversals	Policy & Sustainability	Draft and table e-Governance Act for E&SED to institutionalize reforms and ensure	Medium Term (1–2 yrs)

			continuity and durability	
Teacher Deployment (E-Transfer Policy)	Misalignment of subject-specific teacher needs	HR Policy Refinement	Introduce AI-supported matching system for subject-based postings	Medium Term (1–2 yrs)
Comparative Gap with Punjab	Punjab has stronger legal cover, automated exams, and broader ICT integration	Benchmarking	Adapt Punjab PITB model: low-cost assessments, automated exams, centralized admissions	Medium Term (1–2 yrs)
Digital Content & Curriculum	Curriculum digitization incomplete; weak uptake in rural areas	Content Modernization	Develop low-bandwidth digital content, integrate with textbook board, incentivize usage	Medium–Long Term (2–4 yrs)
Budget & Resources	No separate budget line; project-based, donor-driven initiatives	Financial Sustainability	Create a dedicated budget line for ICT & e-governance; ensure O&M (operation & maintenance) financing	Short Term (6–12 months)
System Integration	Fragmented platforms (EMIS, HRMIS, BISEs, ESEF, PSRA) not fully integrated	Interoperability	Develop APIs & integration strategy to merge databases and avoid duplication	Short Term (6–12 months)
User Satisfaction	Technical glitches frustrate teachers/parents; poor grievance redressal	Service Quality	Launch provincial helpdesk, user feedback surveys, SLA-bound support	Short Term (6–12 months)
Cybersecurity & Data Governance	Risks of data breaches, no provincial framework	Data Protection	Establish a provincial data governance & cybersecurity	Short Term (within 6 months)

			policy; role-based access, encryption	
Monitoring & Evaluation	Weak monitoring in merged districts (MAEF, rural areas); EMA data reliability issues	Accountability	Strengthen EMA with offline sync tools, third-party audits, and field training	Short–Medium Term
Technical Capacity	Shortage of IT professionals, lack of digital literacy among teachers	Capacity Building	Regular ICT training programs, appoint regional IT officers, develop helpdesks	Short–Medium Term (6 months – 2 yrs)

17. Conclusion

From perusal of all the collected data, it is concluded that e-governance in Khyber Pakhtunkhwa's Elementary and Secondary Education Department (E&SED) represents a significant yet incomplete transformation of governance and service delivery. Initiatives like Education Management Information System (EMIS), Human Resource MIS, e-Transfer Policy, online examination systems, and Education Monitoring Authority (EMA) have revolutionized education system, reduced favoritism, and introduced transparency into teacher management and student services. These reforms have improved efficiency, enhanced accountability, and enriched user satisfaction, particularly in urban areas where internet connectivity and digital literacy are stronger.

However, the study reveals that the impact remains uneven and conditional. Schools in remote and tribal districts continue to face limited benefits due to poor internet access, lack of IT infrastructure, low digital literacy, and fragmented system integration. The absence of a dedicated AI based real time monitoring of data, budgetary allocation, a comprehensive legal framework, and sufficient technical staff further threatens sustainability. Resistance to change among employees, misalignment in teacher deployment under e-transfer policies, and data governance gaps exacerbate these challenges.

Comparative analysis with Punjab, India and UK reveals that KP lags behind in legislative cover, centralized systems, and resource allocation. The KP Government has yet to institutionalize e-governance through binding laws and robust policy frameworks, leaving reforms vulnerable to administrative discretion and political shifts.

For e-governance in KP's education sector to achieve its full potential, reforms must be consolidated under a comprehensive E-Governance Act, backed by a dedicated budget, and supported by a practicable framework that integrates EMIS, HRMIS, BISEs, and other bodies. Investment in teacher digital literacy, localized digital content, and inclusive platforms will be critical to ensuring equity. Additionally, partnerships with private ed-tech providers and lessons from regional models like India's DIKSHA can accelerate progress in education.

In conclusion, while KP has demonstrated commendable progress, the journey toward sustainable, transparent, and citizen-centric e-governance requires political will, legal cover, financial sustainability, and inclusive design. With these measures, the education sector in KP

can move from fragmented digital interventions to a coherent, resilient, and equitable digital ecosystem capable of transforming governance and service delivery for all citizens.

18. Recommendations

18.1 Legal and Policy Framework

Draft and legislate a dedicated E-Governance act and rules/regulations covering all aspects including powers, functions, domains etc. for E&SED to institutionalize reforms, provide sustainability and reduce dependence on ad-hoc policies & arrangements.

The provincial level legislation may be aligned with E&SED legal frame work in order to avoid from overlapping and legal complexities.

18.2 Financial Sustainability

Budgetary allocation and financial stability may be ensured for e-Governance initiatives in order to strengthening e-Governance operations in light of the political commitments. Donors may be approached for further expansion of e-Governance initiatives.

Sufficient budget may be allocated to meet the recurring operation & maintenance (O&M) for software upgrades and IT staffing to prevent system collapse.

18.3 System Integration

Develop vigorous system and practicable updated strategies to integrate EMIS, HRMIS, BISEs, ESEF, MAEF, PSRA and other attached formats reducing data duplication and fragmentation.

Centralized digital education portal may be created for consolation of all e-Governance initiatives including e-content, teacher training modules, student assessments and school monitoring.

Spatial support system may be established using advanced AI technology.

18.4 Bridging the Digital Divide

Internet connectivity may be extended immediately to rural and merged areas in order to bring them at par with the urban regions of KPK.

IT devices may be provided to all stakeholders of least developed regions.

Comprehensive, inclusive, localized and multi-language contents may be developed to ensure accessibility through e-Initiatives.

18.5 Teacher Deployment & HR Reforms

Refine the e-Transfer Policy with an AI-supported matching system to align postings with subject-specific requirements in order to avoid academic and administrative issues.

Digitize HR processes e.g., retirement, ACRs, promotions to reduce discretion and delays.

18.6 Curriculum and Digital Content

DCTE and Text Book Board may be bound to accelerate digitization of curriculum

Introduce virtual labs and e-classes (building on India's OLABs model) to addresss the issues of unavailability of science labs.

18.7 Capacity Building & Change Management

Regular ICT training programs may be arranged for teachers and administrative staff.

All vacant posts of IT officers may be filled and technical support may also be provided regularly.

Incentivize adoption of digital tools through orientation programs and recognition systems.

18.8 Monitoring, Accountability & Transparency

An advanced and AI supported mechanism may be introduced which can strengthen EMA for real time monitoring and accountability.

Launch public dashboards of teacher attendance, transfer timelines, and school functionality.

Mandate audit trails and periodic third-party reviews of HR and exam systems.

18.9 Data Governance & Cybersecurity

Establish a provincial data governance and cybersecurity policy with mandatory encryption, role-based access, and incident response protocols.

Conduct regular security audits of exam, HR, and student data systems.

18.10 Comparative Best Practices & Partnerships

Adapt Punjab's low-cost assessment programs, automated exam systems, and centralized admissions models.

Leverage public-private partnerships (PPPs) with ed-tech firms for content development, teacher training, and technology support.

Institutionalize partnerships (e.g., with NOON Academy, STEAM programs) for large-scale rollout.

18.11 Multi-Channel Delivery for Resilience

Develop multi-model learning systems (TV, radio, mobile apps, offline sharing) to ensure continuity of education during crises like pandemics or natural disasters.

Scale up community access points (union councils, local centers) linked to school EMIS services for parents without digital devices.

18.12 A proper mechanism of coordination with academia should be institutionalized to evaluate the data available with EMA and EMIS and to undertake evidence-based research for identifying systematic issues and proposing informed solutions to strengthen ICT in E&SED.

19. Log Frame Recommendations Matrix



Issues and Challenges	Proposed Mitigation Measures	Action to be Taken	Any amendments in rules, regulations required?	Entity responsible for	Time required	Risk Involved	Cost Involved	Intended Outcomes
Fragmented & Siloed Systems (EMIS, HRMIS, BISEs not integrated, data duplication)	Develop a centralized digital ecosystem.	1. Develop APIs and an integration strategy. 2. Create a single provincial digital education portal consolidating e-content, training, assessments, and monitoring.	Potentially new SOPs for data sharing and management.	E&SED (EMIS Wing) lead, with KPITB & all attached departments (BISEs, ESEF, PSRA)	Medium Term (1-2 yrs)	Technical complexity, resistance to data sharing, interoperability issues.	High (Software development, integration consultancy, hardware upgrades).	Seamless data flow, reduced duplication, a single point of access for all services, data-driven decision-making.
Lack of Legal Framework (Reforms vulnerable to policy change; no legal cover for e-gov)	Institutionalize e-governance through binding legislation.	Draft and table a dedicated "E-Governance in Education Act" to provide sustainability and legal backing.	Yes. A new Act is required. Draft new rules/regulations under it.	E&SED with Law Department, backed by Provincial Cabinet/Assembly	Medium Term (1-2 yrs)	Political resistance, legislative delays, potential for a weak Act.	Low (Drafting and legislative process costs).	Reform durability, continuity across administrations, enforceable mandates, and clear domains of power.
Financial Instability (No dedicated budget; reliant on donor projects)	Ensure dedicated and sustainable funding.	1. Create a separate budget line for ICT & e-governance. 2. Secure funding for Operation & Maintenance (O&M).	Yes. Amendments in financial rules/budgeting processes to create new budget lines.	E&SED, Finance Department	Short Term (6-12 months)	Budgetary constraints, competing priorities, withdrawal of donor funds.	Medium to High (Recurring annual expenditure for O&M, software and licenses, and upgrades).	Sustainable systems, timely upgrades, dedicated IT staff, and long-term project viability.
Digital Divide (No internet/devices in remote areas; low digital literacy)	Ensure equitable access and inclusivity.	1. Expand connectivity projects to rural/merged areas. 2. Provide device grants to schools/teachers. 3. Develop low-bandwidth, multi-language, localized e-content.	None specifically, but requires policy shift in resource allocation.	E&SED with KPITB, Merged Areas Dept., & Service Providers	Long Term (3-5 yrs)	High cost of infrastructure, logistical challenges in remote terrain, maintaining devices.	Very High (CAPEX for infrastructure, devices, and content development).	Equitable access to e-services, improved learning outcomes in rural areas, reduced inequality.
Inefficient Teacher Deployment (e-Transfer policy)	Refine HR policies using intelligent technology.	Integrate an AI-supported matching system into the e-Transfer portal to align postings with subject vacancies.	Yes. Amendment to the e-Transfer Policy	E&SED (HR Wing + EMIS Wing) with KPITB	Medium Term (1-2 yrs)	Algorithm bias, data accuracy issues, resistance from	Medium (AI software development, integration with HRMIS).	Optimal teacher utilization, addressed subject shortages,

ignores subject-specific needs)			rules and procedures.			staff benefiting from the old system.		improved student learning outcomes.
Outdated Curriculum & Content (Slow digitization; weak uptake in rural schools)	Accelerate content modernization and delivery.	1. Mandate DCTE & Textbook Board to digitize full curriculum. 2. Introduce virtual labs (e.g., India's O Labs model) for science. 3. Incentivize digital content usage.	Potential updates to curriculum development guidelines.	Directorate of Curriculum & Teachers Education (DCTE), Textbook Board	Medium-Long Term (2-4 yrs)	Development cost, resistance to pedagogical change, ensuring quality of digital content.	High (Content creation, software licensing for virtual labs, training).	Modernized teaching resources, bridged science lab gap, engaging and accessible learning materials.
Low Technical Capacity & Resistance (Lack of IT staff; low digital literacy; staff resistance)	Implement large-scale capacity building and change management.	1. Conduct regular ICT training for teachers & admin staff. 2. Fill vacant IT officer posts. 3. Establish a provincial IT helpdesk. 4. Run orientation programs to incentivize adoption.	None specifically.	E&SED (Reforms & Implementation Wing), S&GAD	Short-Medium Term (6 months - 2 yrs)	Resistance to change, training fatigue, high turnover of trained staff.	Medium (Training programs, hiring costs, helpdesk operation).	Increased adoption rates, efficient use of systems, reduced technical glitches, empowered users.
Weak Monitoring & Cybersecurity (EMA data reliability issues; no data governance policy)	Strengthen accountability and protect data.	1. Provide EMA with offline-sync tools for remote areas. 2. Establish a provincial data governance & cybersecurity policy with encryption and access controls. 3. Conduct regular security audits.	Yes. New data governance and cybersecurity policy required.	E&SED, EMA, KPITB	Short Term (Within 6 months for policy)	Data breaches, loss of public trust, cyber-attacks on exam systems.	Low (Policy development) to Medium (Security audits, software tools).	Reliable data, protected student/teacher information, maintained public trust in systems.
Lack of Resilience (No system for education continuity during crises)	Build a multi-channel service delivery system.	Develop multi-model learning systems (TV, radio, mobile apps, offline content) for crisis situations.	None specifically.	E&SED, DCTE, KPITB	Medium Term (1-2 yrs)	Coordination between channels, content quality control, ensuring widespread access.	Medium (Content production, platform development, partnerships with media).	Uninterrupted education during pandemics/disasters, greater reach to marginalized communities.

20. RISK MITIGATION AND CONTINGENCY STRATEGY (PLAN-B)

Plan B: Ensuring Continuity in Education Beyond E-Governance

It is a widely recognized fact that e-governance has played a pivotal role in enhancing efficiency, transparency, and accountability in the education sector as well. The system is not only cost-effective but also time-saving, providing real-time monitoring and decision support. However, it must be acknowledged that no technological initiative is free from risks, whether due to cyber threats, system failures, lack of digital literacy, or infrastructural breakdowns or poor discontinuity of connection. If e-governance initiatives face disruption, there is a strong need for a Plan B to ensure that the education process continues without interruption. Education is, after all, the backbone of human capital development and national progress.

Role of E&SED and Existing Structures

The Elementary and Secondary Education Department (E&SED), Government of Khyber Pakhtunkhwa (KP), is one of the largest and most important departments, constitutionally mandated to provide free and compulsory education to children across the province. It oversees a vast network of institutions divided into:

Primary Schools (KG to Grade 5)

Middle Schools (Grade 6 to 8)

High Schools (Grade 9 to 10)

Higher Secondary Schools (Grade 11 to 12)

The department works through both attached and autonomous bodies, the most prominent being the Elementary and Secondary Education Foundation (ESEF) and Merged Area Education Foundation (MAEF). The ESEF and MAEF have already demonstrated success in improving literacy rates and establishing community-based girls' schools for out-of-school children throughout the province.

Plan B Mechanism/ procedure and measures

In case of any risk or disruption to e-governance initiatives in E&SED, the following contingency measures are proposed:

Primary and Middle Schools to ESEF and MAEF (Community-Based Model)

All Primary (KG–5) and Middle (6–8) schools will be temporarily handed over to ESEF for operation under its community-supported model.

This model is already proven to be cost-effective, flexible, and community-friendly, with no complex establishment procedures.

It will not only sustain existing schooling but also accelerate the enrollment of out-of-school children, ensuring inclusivity even during governance disruptions.

High and Higher Secondary Schools on PPP Model

All High (9–10) and Higher Secondary Schools (11–12) will be shifted to a Public–Private Partnership (PPP) model.

PPP has been recognized globally as a successful mechanism for maintaining quality education, resource optimization, and accountability.

This approach will mobilize private sector expertise and financing, while the government retains oversight, ensuring that education remains accessible, affordable, and uninterrupted.

Additional Supporting Measures

Decentralized Decision-Making: Empower local school management committees (SMCs) and Parent Teacher Councils (PTCs) to take swift decisions in coordination with ESEF, MAEF and PPP partners.

Integrated Approaches: Even if e-governance weakens, offline, paper-based monitoring and reporting mechanisms should be kept functional as backups.

Capacity Building: Teachers and administrators must be trained to adapt quickly to community-based and PPP models when needed.

Resource Mobilization: Engage civil society, local philanthropists, and NGOs to strengthen the contingency framework.

In short, Plan B ensures that education in KP does not become hostage to technology failures or governance bottlenecks. By leveraging community ownership through ESEF and MEAF at the primary and middle level, and harnessing public-private partnerships at the high and higher level, the system can remain resilient, inclusive, and future-oriented.

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