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Discussion Paper - 1

## **Developing a Knowledge Management Culture in the Elementary & Secondary Education Department**

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## Contents

Acronyms .....	ii
Executive Summary.....	1
Introduction .....	2
Context.....	3
Topic.....	4
1. Enabling Environment:.....	6
2. System Soundness: .....	7
3. Data Quality: .....	7
4. Data Utilisation for Decision-making: .....	8
Opportunities and Challenges .....	8
Recommendations .....	10
1. Improving Data Quality .....	10
2. Bridging the Communication Gap.....	10
3. Building Skills and Knowledge to Strengthen Education Service Delivery.....	10
References .....	10

## Acronyms

ASC	Annual School Census
DCMA	Data Collection and Monitoring Assistants
DCTE	Directorate of Curriculum and Teacher Education
E&SED	Elementary and Secondary Education Department
EMIS	Education Management Information System
ESDSS	Educational Spatial Decision Support System
ESP	Education Sector Plan
ESRU	Education Sector Reforms Unit
iEMIS	Integrated Education Management Information System
IMU	Independent Monitoring Unit
KESP II	Khyber Pakhtunkhwa Education Sector Programme II (DFID-funded)
KP	Khyber Pakhtunkhwa
KP-ESPSP	Khyber Pakhtunkhwa Education Sector Plan Support Programme (EU-funded)
PITE	Provincial Institute for Teacher Education
SABER	Systems Approach for Better Education Results
SIF	School Improvement Framework
SMIS	School Management Information System
SOPs	Standard Operating Procedures

# **Developing a Knowledge Management Culture in the Elementary & Secondary Education Department**

## **Executive Summary**

We encourage the senior management of E&SED to reflect on the learning outlined in this paper to establish a working culture based on sound knowledge management – one that sees data management as a service as well as a technical system, and utilises data strategically and effectively. This paper outlines opportunities for the E&SED to do this through the establishment of data quality standards; the definition of clear supply and demand roles and responsibilities across the Department; and the effective integration of multiple data sets. The learning derived from the EU’s technical assistance to the Department (through the KP-ESPSP Programme) identifies clear areas of focus that can enhance education service delivery in KP as a result of better management and use of data.

## Introduction

Khyber Pakhtunkhwa (KP), like other provinces of Pakistan, has invested significant resources in the collection, processing, and management of more and better data through its Education Management Information System (EMIS). However, these investments have not been matched by a robust emphasis on the use of data for policy-making, planning and decision-making. Part of the reason for this is that existing linkages between EMIS and other attached institutions of the Elementary and Secondary Education Department (E&SED) are generally perceived to be weak when viewed as a coherent system. Anecdotal evidence also indicates that the various offices of E&SED find limited utility in the available EMIS datasets, as far as their respective planning and decision-making processes are concerned.

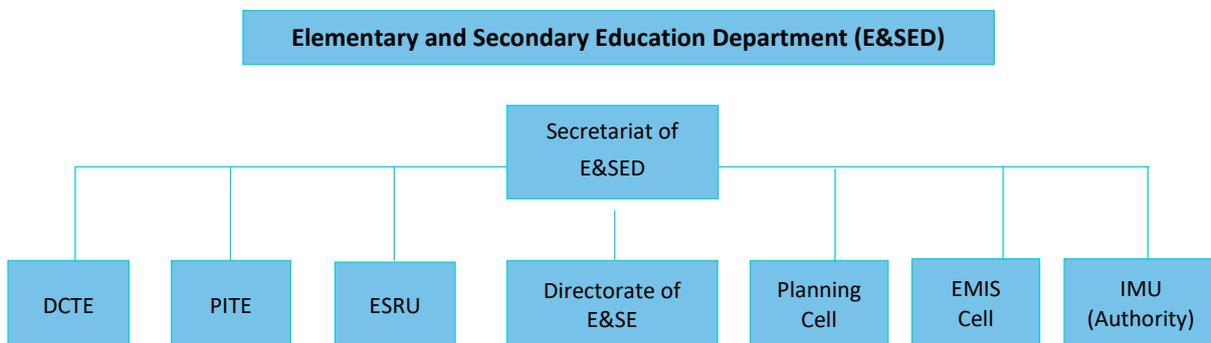


Figure 1 Elementary and Secondary Education Department Structure

At the same time, the work of the E&SED is compromised by capacity weaknesses in the use and interpretation of available data, which negatively affects the quality of longer-term planning across the Department.

The perception that EMIS data are not fit for purpose has arisen in part because the data are not based upon the kind of defined quality standards which would support detailed verification and validation, and clearly articulate the service that the EMIS cell should provide to the rest of the E&SED. Besides the EMIS cell, the Independent Monitoring Unit (IMU) also collects data on a regular basis. From 2017-18 onwards, the E&SED has been integrating both of these supply-side mechanisms for gathering and analysing education data - the EMIS Annual Schools Census (ASC) and the IMU monthly data collection system. The Census data are now being collected through the IMU’s Data Collection and Monitoring Assistants (DCMAs). They collect data from the schools through smartphones using a purpose-built Android-based application. This approach reflects better joined-up thinking, although the emphasis on IT-based solutions needs to be matched by developing the capacities of the system so that the Department is able to institutionalise this IT-based system of gathering and analysing. Consequently, effective and efficient data management in E&SED needs a strategic

re-think in order to make it fit for the purpose of evidence-based planning and decision-making.

This policy paper looks at the current state of data usage in E&SED and explores opportunities to improve the way in which decisions are made using reliable data to develop a working culture based on sound principles of knowledge management. The paper examines the role of the EU-funded Khyber Pakhtunkhwa Education Sector Plan Support Programme (KP-ESPSP) and how its interventions have been addressing the supply (EMIS cell) and demand (from other institutions of E&SED) sides of data provision and use.

## Context

Data and knowledge management play a crucial role in establishing strong education systems. The role of robust, good quality data is fundamental to the process of tracking implementation progress of the KP-ESP 2015-20, for example. And in the same way, the availability and use of good data is central to

### Education Management Information System

A system responsible for collection, maintenance, analysis, dissemination, and utilisation of data in an education system.

(World Bank, 2017)

monitoring the success of the School Improvement Framework (SIF) that DFID is piloting in the province through the Khyber Pakhtunkhwa Education Sector Programme (KESP) II.

The World Bank's Systems Approach for Better Education Results (SABER) for EMIS identifies four policy goals that are essential for a well-functioning EMIS system and service: a) an enabling environment; b) system soundness; c) quality data; and d) utilisation of data for decision-making (World Bank, 2017). This paper examines the E&SED's approach to data use in relation to these four goals, focusing on important learning that has accumulated during phase I of the EU's KP-ESPSP Programme.

The quality of EMIS data and their accuracy, reliability, relevance and availability has been an on-going concern for some time and has resulted in the low confidence of the senior management of E&SED to make use of this data in their decision-making<sup>1</sup>. This point is also highlighted in the Khyber Pakhtunkhwa Education Sector Plan (ESP) 2015-20 where it states three principal limitations of EMIS data: a) delay in data collection and analysis; b) quality concerns; and c) missing indicators<sup>2</sup>. However, it does not clearly identify how to overcome those limitations. The extent to which this is still the case in 2018 is open to question, as a considerable amount of time has been invested to upgrade the skills of the EMIS team, as well

<sup>1</sup> KP-ESPSP (2017)

<sup>2</sup> E&SED (2016), page 23

as the IMU data gatherers. The emerging narrative about the accuracy of EMIS data is not supported by the latest EMIS data collected by IMU. Those data support previous enrolment trends established by the EMIS cell at all levels of the school system. The service IMU provided was elimination of over-reporting of enrolments by schools. This was no longer possible as class/school enrolments could be regularly verified and cross-checked using data collected by the IMU.

From the policy perspective it is important to introduce some balance into a rather one-sided argument which has tended to lay the blame solely on the supply side of the equation (i.e. the staff of the EMIS cell). If we accept the precepts of the World Bank's definition of EMIS, then responsibility and accountability for the system as a whole has to be shared between the supply side (EMIS and IMU) and the demand side (i.e. the users of data).

The EU's KP-ESPSP Programme conducted a Needs Assessment Study of the EMIS system and service to identify individual and institutional level needs and where capacity strengthening was required. That Study identified six priority areas which have formed the basis of an extensive capacity development intervention targeted at both the supply and demand dimensions of data analysis and use. A series of linked interactive workshops was conducted between December 2017 and May 2018 bringing together the supply and demand issues in a coherent approach to strengthen the service function of the EMIS cell's work across the E&SED. At the same time end-

#### **EMIS Capacity Development 6 Priority Areas**

1. Managing accurate, reliable and timely data and development of data quality standards
2. Use of EMIS data for strategic planning and M&E of implementation
3. Effective dissemination of EMIS data – enhancing reporting and presentation skills
4. Use of ESDSS, GIS and integration of datasets for effective planning and informed decision-making
5. Formulation and use of education indicators
6. Development of demand-driven reports for technical & non-technical audiences

users of data in the E&SED have received training to enhance their skills in using data to strengthen management of key functions in the delivery of basic education services. These priority areas remain important even with the recent announcement of the establishment of the IMU as a separate authority with a wide mandate concerning the gathering and analysis of data for the E&SED. The priority areas are valid because they speak to an essential function of the E&SED – the provision of useful data for evidence-based decision-making.

## **Topic**

The EMIS function in E&SED has not been able to provide education planners and managers with reliable and accurate information to frame key strategic decisions about future service provision, or for monitoring education indicators over time (as is required when implementing

an education sector plan, for example). At the same time, education planners and managers have not routinely demanded and used EMIS data to inform their own work. The reasons for this are somewhat opaque, but what is apparent in the E&SED is a confidence deficit characterised by:

- a small EMIS staff who are not confident in promoting the service function of their work (as they have been restricted largely to a data-gathering function);
- data users who are not confident in their own skills to understand and use data strategically;
- data users who lack confidence in the accuracy and reliability of EMIS data (for a variety of coherent and not-so-coherent reasons), and
- the absence of quality standards and Standard Operating Procedures (SOPs) to strengthen and professionalise data collection, verification and validation.

A good example of this is seen in the Educational Spatial Decision Support System (ESDSS) which was developed to enable E&SED managers and planners to select, organise, present, and interact with EMIS data to inform their own decision-making. However, the ESDSS has not been fully utilised. This is because insufficient attention was paid to fully understanding ESDSS and the importance of prioritising data quality, and the skills of officials were not developed to use it.

The effectiveness of EMIS data has been further weakened by the limited research and analysis capacity of the EMIS cell to generate quality reports which are understandable (and useable) for a non-technical audience. Currently, there is a lack of a systematic approach to disseminating EMIS data and generate useful knowledge products based on the data. Lack of capacity and limited budgets may help to explain this, but at the same time the EMIS resource has not been effectively managed by E&SED. Existing job descriptors of EMIS staff are not always consistent with the technical or managerial nature of the positions, and the 2017 Needs Assessment Study of EMIS revealed that EMIS staff at the provincial and district levels are frequently asked to perform functions that are not relevant to an EMIS function. This has compromised the ability of the EMIS cell to perform its role effectively.

For some time, the issue of data management has been complicated by a lack of clarity about the roles of the EMIS and IMU, and little evidence of integrated working. In recent months the E&SED has taken a more proactive management approach with the IMU becoming more involved in the production of the Annual Schools Census Report. At the time of writing (March 2018), the IMU has been notified as a new Authority, with wider responsibilities, operating under a Director-General answering to the Secretary Education. An important role for the E&SED's senior management will be to articulate clearly how this new authority will interact with EMIS and with other attached institutions of the E&SED. If it does not, then an

opportunity to professionalise data analysis and use and build a knowledge management culture will have been missed.

Another significant management initiative has been the decision to develop an integrated EMIS (iEMIS) system which will bring together all the existing databases in E&SED and supply relevant, reliable and timely information to guide educational policy, planning and management decisions. The iEMIS needs to be used to facilitate enhanced collaboration between different units of the Department and improve knowledge management to strengthen effective policy and planning. This can only be achieved through clear custodianship of the data which provides regular and easy access to data for end-users.

The approach of the KP-ESPSP Programme has been to include concepts such as knowledge management and integrated ways of working into training programmes in order to broaden the perspectives of participants so they understand their collective roles in the gathering, analysis, management and use of data more completely. While it is too early to judge whether these ideas are being institutionalised in the Department, levels of understanding and engagement seen in the capacity development training point to a number of positive indicators which need to be nurtured by senior managers over time.

The key emerging results of the KP-ESPSP capacity building initiative with regard to data analysis and use include:

**1. *Enabling Environment:***

EMIS is both a system and a service for data collection, analysis, management and use. To address the challenges in the current system, the KP-ESPSP Programme has worked with provincial and district level EMIS staff to develop hands-on data analysis and reporting skills; provided mentoring support to implement the School Management Information System (SMIS) and trained the provincial EMIS team in improved presentation and analyses of data. A key area of learning has been that focusing on these areas alone is not sufficient to transform the EMIS function. Consequently, the capacity development initiative has focused an equal amount of time on the service nature of the EMIS function to balance the conventional view of EMIS which see it solely as a technical system. This is an essential part of the enabling environment for better management of data across the E&SED.

**Whether the tasks of data gathering and analysis are done by EMIS or IMU is, in a sense, immaterial – all managers need to realise that efficient knowledge management requires them to be aware of what is available; that the relevant custodian makes it available; and that E&SED managers articulate their data needs. Capacity development is necessary to enable managers to make the best use of data,**

partly through trial and error and partly through a systematic process of asking questions and seeking answers from qualitative and quantitative data. At the present time, there is a strong argument to consolidate what the E&SED has in the way of data sets and focus on a set of specific questions to which it requires answers. In this way, the institutions of E&SED can begin to construct a knowledge management system that works with the specific conditions and requirements of the Department.

**KP-ESPSP  
Capacity Development  
Data-related training workshops**

**Supply Side**

- Data collections methods, tools, and sampling
- Data quality standards, data verification and validation procedures
- School Management Information System (SMIS)
- Dashboard reporting and advanced data analyses with Excel

**Demand Side**

- Importance of data for effective planning and management
- Accessing and using SMIS for informed decision-making
- Monitoring and evaluation skills development utilising qualitative and quantitative data
- Strengthening of planning skills and project formulation skills using data

**2. System Soundness:**

The KP-ESPSP’s capacity development initiative has made a deliberate effort to target both EMIS and IMU in its training. This is especially important at the present time, when the IMU is being changed into an Authority and the nature of its precise relationship to the E&SED remains undefined. **It is the responsibility of senior management to ensure a complementary relationship between IMU and EMIS (and the other institutions of E&SED), build trust, and facilitate the availability and use of reliable data. System soundness of this kind is a prerequisite for effective knowledge management.**

**3. Data Quality:**

The E&SED currently does not have any data quality standards or SOPs for data gathering, analysis, verification or management. These standards are necessary to improve the quality of the data service and to build trust across the system so that the data are actively and regularly used. To address this need, the KP-ESPSP Programme has started the process of developing data standards with the E&SED. **This is an area of work that needs to be prioritised, with an equal focus on the supply and demand aspects of the system, so that the working relationship between the E&SED and the IMU authority is collaborative and based on joint responsibility.**

#### 4. *Data Utilisation for Decision-making:*

The EMIS Needs Assessment Study of 2017 recommended the development of an integrated EMIS function (iEMIS) to address the confusion of multiple datasets, build trust in the system and service, and reinvigorate a culture of data-driven decision-making in E&SED. The E&SED has recently initiated the process of developing the iEMIS. **This will provide a more robust framework to guide planning and management and avoid duplication, and will be essential in establishing an efficient and effective IMU authority and articulating its relationship to the E&SED.**

### Opportunities and Challenges

The KP-ESPSP initiative has presented the E&SED with several opportunities to improve knowledge management by encouraging greater use of data for decision-making and strengthening the connection between the supply and demand sides of the data issue. This is essential for day-to-day monitoring of the school system as well as for more strategic functions of the department in reviewing progress against the Education Sector Plan, for example, and making decisions about its revision. The opportunities and associated challenges for the E&SED to consider are listed in the table below:

Topic	Opportunities	Challenges
<b>Data Standards</b>	Absence of data standards explains why inaccurate data are entered into the system without verification and validation. This results in low confidence among end-users to use data for planning and decision-making. Good knowledge management requires a focus on standards to professionalise the data system and service.	Developing data standards is time-consuming and complex. Responsibilities and relationships need to be clearly defined so that accountability is built into the system. All education sector stakeholders need to be engaged to link the supply and demand aspects of the system and prioritise integrated and holistic service delivery.
<b>Data System and Data Service</b>	It is essential that the E&SED further strengthens a collaborative effort to promote effective knowledge management for informed planning and decision-making. This can best be achieved by strengthening accountability mechanisms which promote the data service function in	With the development of the new IMU authority, the function of the EMIS cell will require fresh thought so that it plays a meaningful role in the education data service and system. At the same time, the relationship between other attached institutions of E&SED and the IMU will need to be

	E&SED and strengthen the data system and data quality.	defined and linked to a data quality standards system.
<b>Integrating Databases</b>	The E&SED has commenced work to produce an iEMIS. This presents the opportunity to develop a framework to strengthen data reliability and the service function of the data owners to their end-users.	The issue of who will be the custodian of the iEMIS needs to be clarified. Once in place, all end-users will need to be trained in how to access and use data. The owners of the iEMIS will require complementary training in how to present and market their data service to end-users.
<b>Developing a Knowledge Management Culture</b>	The EMIS system is largely viewed as a technical system for collecting and storing education-related data. The E&SED needs to provide access to and utilisation of data across the department and clearly define how a knowledge management system will work. This will help the institutions of the E&SED understand how best to interact with the EMIS cell and IMU, and recognise their role in using data more effectively.	The E&SED management needs to develop and institute data standards with clearly defined roles and responsibilities for the IMU authority and EMIS cell.  Knowledge management and data use descriptors need to be included in all job descriptions to strengthen accountability. This should be supported through a programme of training linked to the data quality standards.
<b>Monitoring Implementation of the Education Sector Plan</b>	The E&SED needs to be able to monitor and track implementation progress of the Education Sector Plan in order to identify what is working and what needs to be reviewed and revised. A robust culture of knowledge management with reliable data available from a single source will provide the E&SED with the tools to commission and manage the revision of the current Education Sector Plan.	Ensuring that all the relevant actions and capacity development issues identified in this paper happen in a timely sequence is essential to managing the revision of the ESP later in 2018, so that the E&SED achieves a revised ESP that meets its strategic needs for education service provision in the province.

## Recommendations

A clear opportunity exists for the E&SED to take advantage of the significant learning from the technical assistance being provided to it by the EU and DFID to tackle the challenge of strengthening knowledge management in the Department. This paper has outlined a number of areas that deserve serious consideration by the senior management of E&SED:

### 1. *Improving Data Quality:*

The E&SED requires a data system and service that unifies diverse sources of information and produces user-friendly knowledge products that help senior managers to make decisions and plan accordingly. The E&SED should endorse the development of data quality standards to help develop a knowledge management culture in the Department.

### 2. *Bridging the Communication Gap:*

A system built on data standards will provide an opportunity to clarify roles and responsibilities (demand and supply side) during a period of change while the new IMU authority settles into its work. There is a need to clearly define the role of EMIS in relation to the IMU and also in relation to other institutions of the E&SED. At the same time, those other offices also need to define the nature of their working relationships with the data providers. The communication gap also needs to be bridged with the system of local government in the province to encourage participation and input from the district level.

### 3. *Building Skills and Knowledge to Strengthen Education Service Delivery:*

An integrated approach to data collection and analysis (e.g. the iEMIS) will help to strengthen planning processes, and enhance the quality of decision-making in E&SED. This will help to drive better management of basic education services in the province.

This will not be achieved solely through the provision of new software to manage a database nor through training programmes for key staff. The Department needs to see this as part of a wider and more complex endeavour to change the working culture of the E&SED. The establishment of a new IMU authority and a commitment to develop a reliable single iEMIS both represent significant opportunities to focus on this bigger challenge and develop a system that is confident in using data to inform its decision-making.

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