

# Enabling Environment for EMIS in Bhutan

## Situational Analysis Study Report



Royal University of Bhutan



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# Executive Summary

## Context

Paro College of Education, Royal University of Bhutan, and Druk Gyalpo's Institute secured an international grant to enhance Bhutan's Education Information System (EMIS) and explore its integration with Motherboard—an advanced system capable of generating qualitative data on student performance. The project, *Enhancing Data Utilization and Decision-Making in Bhutan's Education System: Motherboard Integrated Education Monitoring and Information System (MIEMIS)*, is funded by the GPE KIX grant (<https://www.gpekix.org/project/enhancing-data-utilization-and-decision-making-bhutans-education-system-motherboard>).

As a first step, a situational analysis was conducted to assess the current state of Bhutan's EMIS and inform the design of relevant interventions. This study applied the Systems Approach for Better Education Results (SABER) framework and SABER-EMIS tools, engaging 266 schools, 15 Dzongkhag Education Officers, and key stakeholders from the Ministry of Education and Skills Development, including the Policy and Planning Division, Education Monitoring Division, and STEM and ICT Division. Additionally, stakeholders from the Government Technology Agency were consulted.

The study examined four key policy areas influencing EMIS: enabling environment, system soundness, data quality, and utilization for decision-making. This report focuses on the enabling environment, which comprises six levers: (1) Legal framework, (2) Organizational structure and institutional processes, (3) Human resources, (4) Infrastructural capacity, (5) Budget, and (6) Data-driven culture.

Each lever includes sub-levers with specific criteria assessed at the school, district, and ministry levels. The evaluation employed a four-level scale: Latent, Emerging, Established, and Advanced, with definitions varying across each level.

## Findings

Overall, the **Enabling Environment** is rated as Emerging, determined by averaging the benchmarks of its major factors. This rating indicates:

- At the *Emerging* level, the system contains basic components of a comprehensive enabling environment, including a legal framework, organizational structure, institutional processes, human resources, infrastructure capacity, budget, and a data-driven culture.
- While these foundational elements are in place, the system has not progressed to the *Established* level, where most components are present, or the *Advanced* level, where all crucial components are fully functional.
- To advance beyond the *Emerging* level, it is recommended that the components and benchmarks presented in this chapter be reviewed and enhanced to strengthen the enabling environment and ensure greater functionality and support for the system.

The table below provides an overview of the ratings for the individual factors of the Enabling Environment.

Scale (1=Latent, 2=Emerging, 3=Established, 4=Advanced)	1	2	3	4
<b>Enabling Environment</b>		X		
<b>Legal Framework</b>		X		
Institutionalization			X	
Responsibility		X		
Dynamic Framework		X		
Data Supply		X		
Comprehensive and Quality Data		X		
Data Sharing and Coordination		X		
Utilization	X			
Budget	X			
Confidentiality		X		
Organizational Structure and Institutional Process			X	
<b>Human Resources</b>		X		
Personnel		X		
Professional Development	X			
<b>Infrastructural Capacity</b>		X		
Data Collection Means	X			
Database (s)		X		
Data Management System			X	
Data Dissemination Means		X		
<b>Budget</b>		X		
Personnel and Professional Development		X		
Maintenance		X		
Reporting		X		
Physical Infrastructure		X		
Efficient use of Resources		X		
<b>Data-Driven Culture</b>		X		

As indicated in the table, each factor is rated on a four-level scale, indicating specific strengths and areas for improvement, which are further discussed in this report.

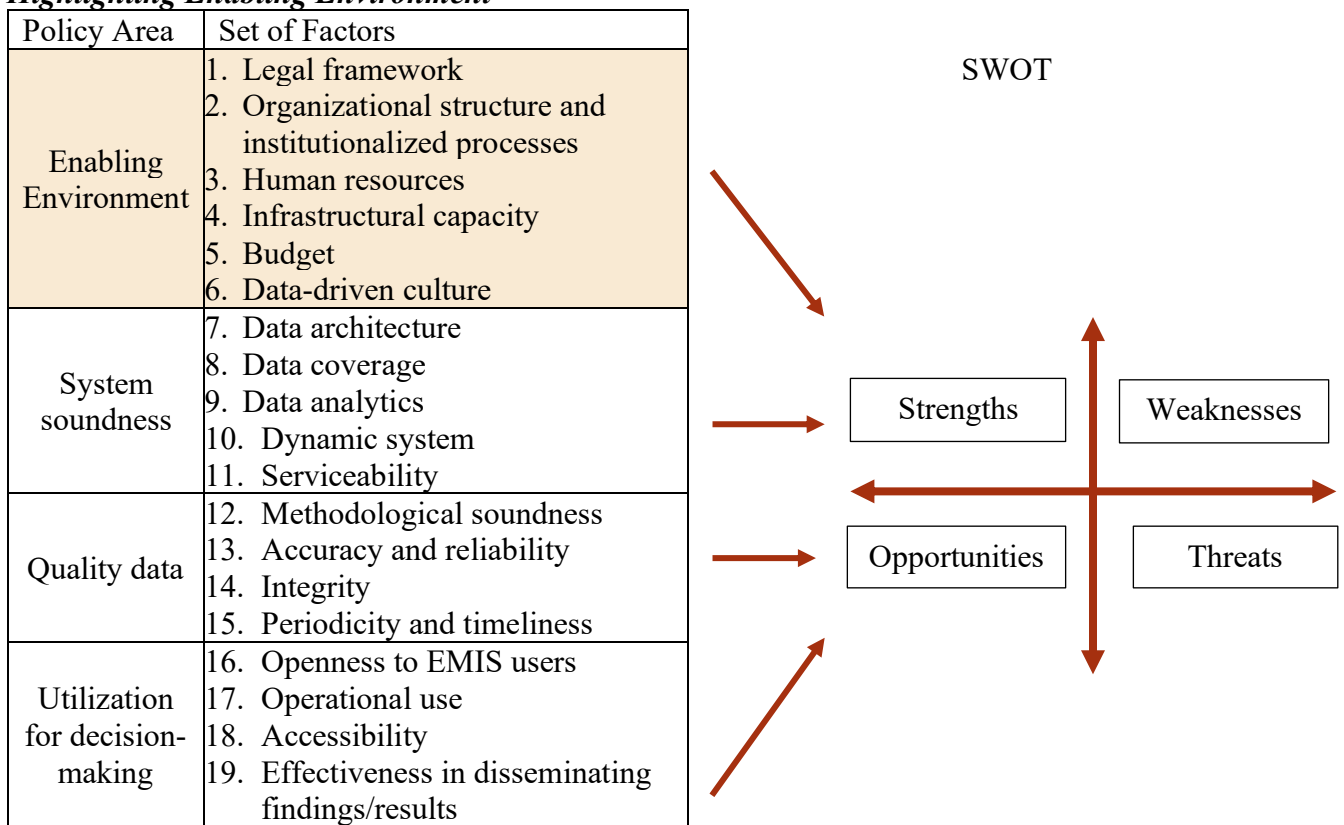
Note: We strongly recommend that readers review Annexure 1 before proceeding with this report.

# Policy Area 1: Enabling Environment for EMIS

## 1.1 Introduction

The enabling environment refers to a system that integrates essential components designed to support establishing and operating an effective and dynamic framework. Figure 1.1 outlines six critical factors: Legal Framework, Organizational Structure and Institutionalized Processes, Human Resources, Infrastructural Capacity, Budget, and Data-Driven Culture. Each factor includes specific items with variables that collectively reflect the overall health and functionality of the system. These factors are analyzed by reviewing general trends, evaluating them item by item, and making actionable recommendations to strengthen the enabling environment (see Appendix 1 for information the study background, including sample size).

**Figure 1.1**  
***Highlighting Enabling Environment***



## 1.2 Data Analysis, Findings, and Interpretations

The data analysis process was conducted systematically to uncover meaningful insights and provide a comprehensive understanding of the dataset. The analysis was structured around six primary components: general trends, item-by-item evaluation, key contradiction, recommendation,

and a SWOT (Strengths, Weaknesses, Opportunities, and Threats) analysis. Each component provided a unique perspective on the data, offering a broad overview and detailed insights into specific indicators. Furthermore, each indicator was benchmarked on a scale of four levels. The levels are latent, emerging, established, and advanced. The advanced level is shows an indicator meets its standard.

The general trends analysis identify overarching patterns and themes across the dataset, highlighting centralized practices, discrepancies in acknowledgment across operational levels, and areas of strong performance or potential gaps. The item-by-item analysis delves into specific components or indicators within the data, providing a granular understanding of the responses and their implications. The study also presents key contradictions. Finally, the SWOT analysis synthesizes findings to identify strengths and opportunities while addressing weaknesses and threats, offering strategic insights for improvement.

The analytical approach summarizes and interprets the data exclusively using descriptive statistics. This method is chosen to present the results in an accessible and straightforward manner, enabling clear communication of key findings and their implications for policy, practice, and future decision-making.

### 1.3 Legal Framework

General Standard: There is an existing legal framework to support a fully functioning EMIS.

#### 1.3.1 Institutionalization

Standard: EMIS is institutionalized as an integral part of the education system and the government.



EMIS is formally institutionalized with designated leadership, centralized management, and partially developed frameworks at decentralized levels. However, legal and operational gaps remain, requiring further formalization.

The system has reached the Established level due to strong Ministry-level oversight and a clear institutional foundation. To progress to the Advanced level, it must address legal and operational gaps, empower decentralized entities like PPD, and reduce reliance on centralized activities to ensure inclusivity and efficiency.

**Table 1.1**  
*Responses to Items on Institutionalization of EMIS*

Items		GovTech			PPD		
		Yes (%)	No (%)	Level (1,2,3)	Yes (%)	No (%)	Level (1,2,3)
1	Is there a law to create or establish an education management information system that collects, processes, and disseminates education data on a regular basis?	100	0	3	0	100	1

2	Is there a law that calls for an institution, and agency or an official entity to manage the EMIS?	0	100	3	0	100	1
3	Does a designated official entity exist that is responsible for managing the EMIS?	100	0	3	100	0	1
4	Do Government programs incentivize establishment/advancement of EMIS with funding (e.g., funds to establish a longitudinal data system)? If so, please describe in comments.	100	0	3	100	0	1

**General Trends**

The analysis highlights significant trends and gaps in the acknowledgment and operationalization of EMIS institutionalization across GovTech and PPD. GovTech consistently shows higher acknowledgment, reporting “Yes” (1) for most items, reflecting strong institutional engagement. Its operational activity is primarily centralized at the Ministry level (L=3), indicating a top-down approach. PPD, on the other hand, demonstrates limited acknowledgment, reporting “No” (0) for items concerning laws and managing entities. PPD’s operational activity, when present, is limited to the School level (L=1). Contradictions are evident in items like 1\_1A, where GovTech reports “No” (0) for formal laws but shows operational activity at the Ministry level, suggesting reliance on informal practices.

**Item-by-Item Analysis**

The item-specific analysis further underscores these differences. For 1\_1A1 (Law to Create EMIS), GovTech acknowledges the existence of such a law with activity at the Ministry level, while PPD denies its presence and reports activity at the School level. 1\_1A2 (Law for Managing Entity) reveals no formal acknowledgment from either agency, but GovTech reports informal operations at the Ministry level and PDD at the School level. 1\_1A3 (Designated Managing Entity Exists) agrees with GovTech and PPD on acknowledgment with centralized activity at the Ministry and School levels, respectively. For 1\_1A4 (Funding Incentives for EMIS), GovTech and PPD report acknowledgment and operational activity extending to the Ministry and School levels, respectively.

**Recommendations**

To address these gaps, several recommendations are proposed: Enhance inter-agency communication through workshops to align understanding of EMIS policies, formalize informal practices to ensure accountability and consistency, and improve accessibility to funding mechanisms to encourage engagement at all levels. Additionally, capacity-building initiatives are necessary to empower PPD to manage EMIS activities effectively at localized levels. A robust monitoring and evaluation system should also ensure consistent policy application across agencies and levels. By addressing these disparities and fostering collaboration, Bhutan can strengthen its EMIS institutionalization and support a more robust education management system.

**Table 1.2**

***SWOT Analysis for Institutionalization***

Strength	Weakness
GovTech’s consistent acknowledgment and centralized activity at the Ministry level provide a strong institutional foundation for EMIS implementation.	PPD’s limited engagement and lack of acknowledgment of laws, managing entities, and funding mechanisms hinder the system’s inclusivity and effectiveness.
Opportunities	Threats
There is potential to empower PPD, formalize informal practices, and enhance inter-agency collaboration to create a more cohesive and decentralized EMIS framework.	Misalignment between agencies and over-reliance on centralized activity at the Ministry level risk inefficiencies and uneven policy implementation across operational levels.

**1.3.2 Responsibility**

Standard: A clearly designated institution or agency is responsible for collecting, processing, and disseminating education statistics.



A central institution demonstrates some responsibility for EMIS, but gaps exist in coordination and legal acknowledgment at decentralized levels (e.g., Dzongkhag and School levels).

The system exhibits characteristics of an Emerging level due to its centralized strengths and the potential to address weaknesses through capacity-building and legal formalization. However, decentralization and operational consistency remain key areas for improvement.

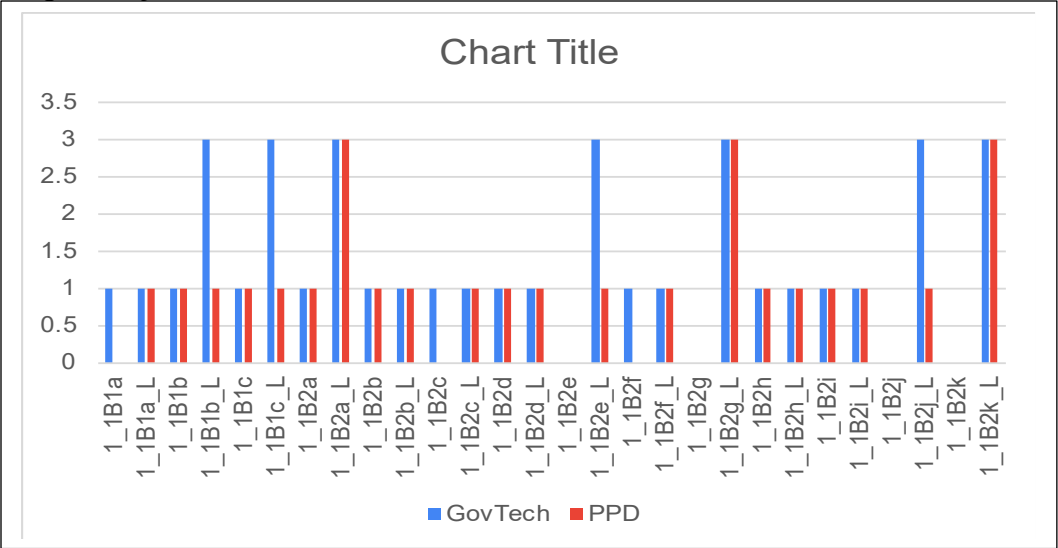
**Table 1.3**

***Items Measuring Responsibility***

1a	Is there a law that clearly specifies responsibilities and prohibits interference between the official education statistics agency and external agencies to collect education data?
1b	Is there a law that clearly specifies responsibilities and prohibits interference between the official education statistics agency and external agencies to process education data?
1c	Is there a law that clearly specifies responsibilities and prohibits interference between the official education statistics agency and external agencies to disseminate education data?
2	Is there a law that specifies the processes and procedures for working with other units and/or other sources of data (examples below are illustrative and may not exist in some countries)?
2a	Population statistics (e.g., census bureau)?
2b	Private sector information (e.g., information from private schools that feed into the EMIS)?
2c	Poverty data (e.g., welfare data; data on individuals receiving government subsidies)?
2d	Geographic Information System (GIS) data (e.g., referenced geographic location information for school buildings) in accordance with industry standards?
2e	Financial data (e.g., government budget for education)?
2f	Early childhood education data (e.g., health data)?
2g	Tertiary education data (e.g., prerequisite course information per student)?

2h	Disability data (e.g., Ministry of Health, policies that support individuals with disabilities)?
2i	Health, medical and hygiene data (e.g., Ministry of Health)
2j	Workforce development data (e.g., technical and vocational programs, workplace readiness)?
2k	Legal/court system (e.g., juvenile court system)?

**Figure 1.2**  
*Responses for Items in Table 2.2*



**General Trends**

The analysis highlights distinct trends in GovTech and PPD engaging with EMIS-related responsibilities. GovTech consistently reports higher acknowledgment, providing Yes (1) responses for most questions concerning legal frameworks for collecting, processing, and disseminating data and collaboration with other data sources. However, GovTech and PPD report no acknowledgment for items 1\_1B2e, 1\_1B2g, 1\_1B2j, and 1\_1B2k, providing No (0) responses. Operational activities are centralized at the Ministry (L=3) and School (L=1) levels, reflecting top-down and bottom-up approaches. PPD demonstrates mixed acknowledgment, combining Yes (1) and No (0) responses and operational engagement at the Ministry and school levels. Key contradictions emerge where GovTech indicates operational activity even for items with No (0) responses, suggesting reliance on informal or practical arrangements without formal legal mandates. Meanwhile, PPD exhibits significant gaps in acknowledgment and engagement, particularly regarding collaboration with other data sources. GovTech and PPD report “No” responses to financial, tertiary education, workforce development, and legal/court system data.

**Item-by\_Item Analysis**

Item-level analysis reveals specific disparities. For 1\_1B1a (Collect Education Data), GovTech reports a legal framework and School-level operation, while PPD denies such a framework and reports School-level activity. Similarly, for 1\_1B1b (Process Education Data), GovTech acknowledges a legal mandate and centralized operations, whereas PPD acknowledges the same

but with School-level operation. For 1\_1B2a–1\_1B2k (Collaboration with Other Data Sources), GovTech shows mixed acknowledgment and reports operational activity at the Ministry level and School-level, even without formal mandates. Similarly, PPD shows mixed acknowledgment and reports operational engagement across all levels. GovTech and PPD report “No” responses to financial, tertiary education, workforce development, and legal/court system data.

**Recommendation**

To address the gaps identified, it is essential to enhance legal awareness and clarity, particularly for PPD, by conducting targeted workshops focused on key legal mandates such as establishing and managing EMIS. Formalizing cross-sector collaboration is also crucial, requiring clear policies and agreements for working with various data sources, including population statistics, GIS data, and health data. Strengthening localized capacity through tailored training programs for EMIS and PPD officials will empower operational engagement at the Dzongkhag and School levels, reducing over-reliance on centralized Ministry-level activities. A robust monitoring framework should also be implemented to track and formalize informal practices, ensuring operational activities align with legal mandates. Finally, raising awareness of funding mechanisms and incentives for EMIS development through targeted campaigns will ensure equitable understanding and utilization across all governance levels. By addressing these recommendations, Bhutan can achieve a more robust, inclusive, and legally aligned EMIS framework.

**Table 1.4**  
*SWOT Analysis for Responsibility*

Strength	Weakness
GovTech and PPD demonstrate strong acknowledgment of legal frameworks and centralized operational engagement at the Ministry level, ensuring a robust foundation for EMIS implementation.	GovTech and PPD exhibit differences in lthe acknowledgment of responses to the questions and operational levels, indicating gaps in identifying responsibilities.
Opportunities	Threats
Workshops, capacity-building programs, and formalized cross-sector collaboration present opportunities to strengthen legal awareness and operational capacity across all levels of governance.	Reliance on informal practices and lack of legal clarity pose risks of inconsistent implementation and hinder sustainable collaboration with other data sources.

**1.3.3 Dynamic Framework**

Standard: The legal framework is dynamic and elastic so that it can adapt to advancements in technology.



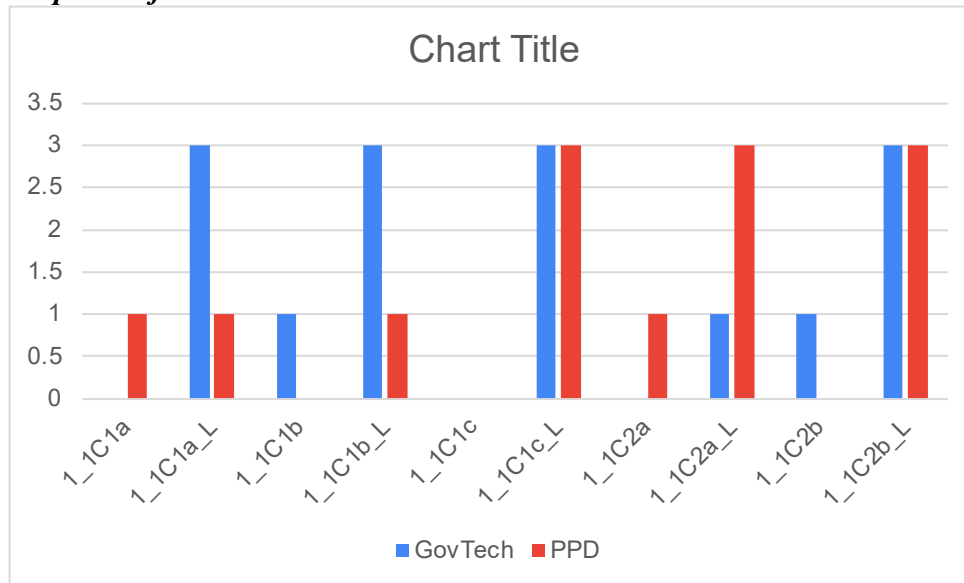
Some elements of a dynamic framework are in place, with centralized adaptability and review processes. However, gaps in decentralized engagement and formal legal mandates limit the framework’s elasticity and alignment with technological advancements.

The system is rated as Emerging because it shows initial progress in building a dynamic framework through Ministry-level reviews and adaptability. However, limited localized engagement, reliance on informal practices, and gaps in formal legal mandates prevent it from reaching the Established or Advanced levels. Prioritizing capacity-building, legal formalization, and inclusive engagement can propel the system toward a more dynamic and elastic framework.

**Table 1.5**  
*Items Measuring Dynamic Framework*

Item	Statement
1_C1	Is the legal framework dynamic and elastic in the following areas:
1_1C1a	Does it prioritize one technology over another?
1_1C1b	Is it adaptable to new technological tools?
1_1C1c	Is it mandated that the framework is reviewed regularly?
1_1C2	Is it mandated that EMIS undergo auditing through:
1_1C2a	Internal reviews?
1_1C2b	External reviews?

**Figure 1.3**  
*Responses for Items in Table 1.5*



### General Trends

GovTech robustly acknowledges items related to EMIS adaptability, regular review, and auditing processes. For items such as technology prioritization, adaptability to new tools, and mandated reviews, GovTech frequently provides affirmative responses (Yes=1). Operational activity is concentrated at the Ministry level (L=3), reflecting centralized management and a focus on maintaining dynamic frameworks for EMIS functionality.

PPD displays mixed acknowledgment, combining affirmative (Yes=1) and negative (No=0) responses. This indicates a lower overall recognition of EMIS-related mandates compared to GovTech. PPD's operational engagement shows limited distribution, with some acknowledgment

at the Dzongkhag level (L=2) but minimal activity at the School level (L=1). These trends suggest significant challenges in localized implementation and engagement.

### Key Contradictions

GovTech occasionally reports operational activity at the Ministry level despite providing negative responses (No=0) to certain items, such as technology prioritization (1\_1C1a). This indicates potential reliance on informal practices or existing systems without formal legal mandates. Conversely, PPD exhibits significant gaps in acknowledgment and operational activity, particularly regarding external reviews (1\_1C2b) and adaptability to new tools (1\_1C1b). These discrepancies highlight a need for improved alignment and understanding.

### Item-by-Item Analysis

The item-by-item analysis reveals notable differences in acknowledgment and operational engagement between GovTech and PPD. For prioritization of technology (1\_1C1a), GovTech reports no acknowledgment (No=0) yet demonstrates operational activity at the Ministry level (L=3), while PPD acknowledges prioritization (Yes=1) with activity at the Dzongkhag level (L=2). In terms of adaptability to new tools (1\_1C1b), GovTech acknowledges adaptability (Yes=1) with Ministry-level activity, whereas PPD denies acknowledgment (No=0) and reports activity at the School-level. GovTech and PPD deny acknowledgment of the mandate for regular reviews (1\_1C1c), but report activity at the Ministry level. PPD acknowledges internal reviews (1\_1C2a) with operational activity at the Ministry level (L=3), which GovTech denies the acknowledgment with operational activity at the School-level. For external reviews (1\_1C2b), GovTech acknowledges their importance (Yes=1) and reports Ministry-level activity, whereas PPD denies acknowledgment (No=0), but reports operational engagement at the Ministry level. This divergence highlights gaps in GovTech and PPD’s engagement and occasional reliance on informal practices.

### Recommendation

To address the observed gaps and inconsistencies, it is recommended that collaboration and communication between GovTech and PPD be strengthened to align their understanding and implementation of EMIS-related mandates, particularly for adaptability and external reviews. Legal mandates should be clarified and formalized to ensure consistent acknowledgment and operational activity across all governance levels, including the Ministry, Dzongkhag, and School. Capacity-building programs should be introduced, focusing on adaptability to new technologies, conducting regular reviews, and enhancing PPD’s operational engagement. A robust monitoring framework should also be established to track legal and operational adherence, address contradictions, and foster a cohesive approach to EMIS management across agencies.

**Table 1.6**  
*SWOT Analysis for Dynamic Framework*

Strength	Weakness
GovTech and PPD acknowledge EMIS adaptability, regular review processes, and auditing mechanisms, with centralized operational activity ensuring robust system management at the Ministry level.	GovTech and PPD demonstrates mixed acknowledgment and limited engagement, particularly at the Dzongkhag and School levels, resulting in gaps in localized implementation and operational alignment.
Opportunities	Threats
Capacity-building programs, enhanced collaboration, and the formalization of legal mandates present	Reliance on informal practices by GovTech and PPD’s lack of acknowledgment for key EMIS mandates pose

opportunities to improve alignment and operational activity across all governance levels.	risks to consistent implementation and the system's long-term adaptability and effectiveness.
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### 1.3.4 Data Supply

Standard: The legal framework mandates that schools participate in the EMIS by providing education data.



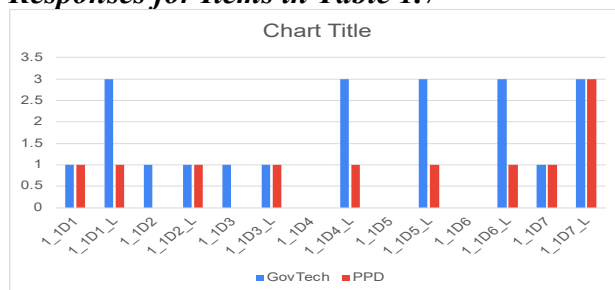
A legal framework for data supply exists, but enforcement mechanisms are weak or inconsistently applied. Centralized oversight ensures partial compliance, but engagement at decentralized levels remains low.

GovTech demonstrates partial alignment with mandates but lacks enforcement mechanisms, while PPD's denial of mandates and contradictory operational responses hinder overall dissemination effectiveness. Training, role clarification, and implementing enforcement mechanisms are necessary for progress toward the "Established" level.

**Table 1.7**  
*Items Measuring Data Supply*

Item	Statement
1_D1	Does the education statistics agency have the legal authority to collect data required to compile educational statistics?
1_1D2	Is there a legal mandate that ensures that schools provide their data to the EMIS?
1_1D3	Does the law specify measures to enforce schools to provide data on time (e.g., assign penalties to schools that do not provide the data on time)?
1_1D4	Are there penalties or warning systems against schools for lack of compliance with the legal mandate for schools to provide education data to the EMIS?
1_1D5	Are schools aware of penalties or warning systems for a lack of compliance with data-related legal mandates?
1_1D6	Does the penalty or warning system cover all schools (e.g., private schools; public schools)?
1_1D7	Is there a law that emphasizes the importance of data and outlines the necessary support to schools for compliance with the process of gathering the data supply?

**Figure 1.4**  
*Responses for Items in Table 1.7*



## **General Trends**

GovTech shows stronger alignment with the EMIS legal framework, affirming items 1\_1D1, 1\_1D2, 1\_1D3, and 1\_1D7. However, GovTech denies items 1\_1D4, 1\_1D5, and 1\_1D6. GovTech's operations are primarily at the ministry level (L=3) but also involve the school level (L=1). On the other hand, PPD denies most items except 1\_1D1 and 1\_1D7. PPD associates operational levels for nearly all items with L=1, which reflects school-level activities, even for items it denies (0).

## **Item-by-Item Analysis**

- 1\_1D1:** Both GovTech and PPD affirm the legal authority to collect educational statistics (1). GovTech links this to ministry-level operations (L=3), while PPD ties it to school-level operations (L=1), indicating differing operational focus.
- 1\_1D2:** GovTech affirms the existence of a mandate requiring schools to provide data (1) at L=1, while PPD denies this mandate (0) but still ties it to L=1, creating a contradiction.
- 1\_1D3:** GovTech affirms enforcement measures to ensure timely data submission (1) and associates this with L=1, while PPD denies enforcement measures (0) but similarly links it to L=1.
- 1\_1D4:** Both agencies deny the presence of penalties or warning systems (0). GovTech links this item to L=3, reflecting a policy-level gap, while PPD ties it to L=1, despite denial.
- 1\_1D5:** Both agencies deny that schools are aware of penalties (0). GovTech links this to L=3, while PPD ties it to L=1, again showing inconsistency in PPD's denial and operational level.
- 1\_1D6:** Both agencies deny that the penalty system covers all schools (0). GovTech ties this to L=3, while PPD links it to L=1, despite the denial.
- 1\_1D7:** Both agencies affirm the existence of supportive laws (1). GovTech and PPD both associate this with L=3, reflecting agreement at the policy level.

## **Key Contradictions**

PPD denies key mandates (1\_1D2, 1\_1D3) but links its responses to L=1, reflecting operational involvement without acknowledgment of mandates. Both agencies deny enforcement mechanisms (1\_1D4, 1\_1D5, 1\_1D6) but associate these with operational levels, showing gaps between policy and practice. GovTech's denial of penalties and warning systems (1\_1D4, 1\_1D5, 1\_1D6) at L=3 contrasts with its affirmation of mandates (1\_1D2, 1\_1D3), indicating a lack of enforcement mechanisms to support the mandates.

## **Recommendations**

Both agencies need clear role definitions and structured training on their responsibilities within the EMIS framework. GovTech should focus on bridging policy and practice by implementing enforcement mechanisms for penalties (1\_1D4, 1\_1D5, 1\_1D6) to support the mandates it affirms. PPD must address its contradictions by aligning its operational practices with its responses, especially at the school level. Uniform communication of policies and operational expectations across all levels is critical for institutionalizing EMIS compliance.

**Table 1.8**

***SWOT Analysis for Data Supply***

<b>Strength</b>	<b>Weakness</b>
GovTech demonstrates strong alignment with legal authority (1_1D1) and supportive laws (1_1D7), particularly at the ministry level (L=3).	Both agencies deny enforcement mechanisms, and PPD shows significant misalignment between operational responses and mandate recognition.
<b>Opportunities</b>	<b>Threats</b>
Introducing clear penalties and enforcement mechanisms, along with comprehensive training, can improve operational alignment and compliance.	Inconsistent enforcement and operational contradictions may undermine the credibility of the EMIS framework and compromise data quality.

**1.3.5 Comprehensive and Quality Data**

Standard: The requirement for comprehensive, quality data is specified in the EMIS legal framework.



The legal framework specifies the need for comprehensive and quality data, but enforcement and implementation are inconsistent, particularly at sub-national levels. Centralized oversight is strong, but decentralized coordination and accountability remain weak.

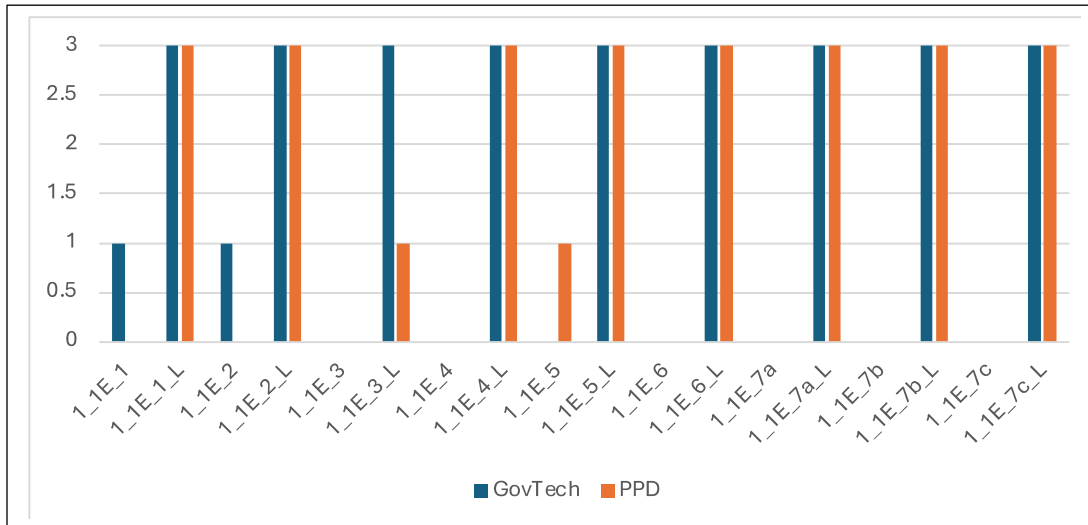
GovTech demonstrates partial compliance with legal mandates but lacks enforcement and monitoring mechanisms, while PPD denies critical mandates and shows inconsistent operational alignment. Clear enforcement policies, monitoring processes, and structured training are essential to progress to the “Established” level.

**Table 1.9**

***Items Measuring Comprehensive and Quality Data***

Item	Statement
1_E1	Is there a legal framework that requires that data exists within the EMIS, and the language of the framework outlines that the data is comprehensive in nature and of a specific quality standard?
1_E2	Does the legal framework explicitly state processes and procedures for local school system test administration and data reporting (e.g., security of materials during testing and storage)?
1_E3	With regard to test administration and data handling, does the legal framework explicitly designate an individual at each local school to manage transfer of test instruments between state and local school entities?
1_E4	If test administration policies are not followed in order to ensure data quality, does the legal framework include penalties?
1_E5	Does the legal framework explicitly state that data need to be integrated from different data sources (e.g., population data, financial data, poverty data, early childhood data) into the EMIS?
1_E6	Does the law specify the requirements and criteria from the data supplier from sources outside of the EMIS?
1_E7	Is there an established and known monitoring process within the EMIS for the following:
1_E7a	Data collection?
1_E7b	Data processing?
1_E7c	Data dissemination oof education statistics?

**Figure 1.5**  
**Responses for Items in Table 1.9**



### General Trends

GovTech and PPD display varying levels of compliance with the legal framework for the EMIS. GovTech affirms the existence of legal mandates for comprehensive data standards (1\_1E\_1) and processes for local school test administration (1\_1E\_2), associating both with ministry-level operations (L=3). PPD denies these items (0). Conversely, PPD affirms (1) the need to integrate data from different sources (1\_1E\_5) at L=3, which GovTech denies (0). Both agencies deny (0) the designation of roles for managing test administration (1\_1E\_3), penalties for policy violations (1\_1E\_4), criteria for external data suppliers (1\_1E\_6), and monitoring processes for data collection, processing, and dissemination (1\_1E\_7a, 1\_1E\_7b, 1\_1E\_7c). Most denied items are linked to ministry-level operations (L=3).

### Item-by-Item Analysis

- 1\_1E\_1:** GovTech affirms (1) the existence of a legal framework for comprehensive data quality standards and links this to L=3, while PPD denies it (0) despite also operating at L=3.
- 1\_1E\_2:** GovTech affirms (1) explicit processes for test administration at L=3, but PPD denies (0) these processes while also linking operations to L=3.
- 1\_1E\_3:** Both agencies deny (0) the designation of roles for test instrument management; GovTech associates this denial with L=3, while PPD links it to L=1, reflecting operational differences.
- 1\_1E\_4:** Both agencies deny (0) penalties for policy violations, associating these responses with L=3.
- 1\_1E\_5:** GovTech denies (0) the need to integrate data from different sources, while PPD affirms it (1) at L=3, reflecting divergence in perspectives on integration mandates.
- 1\_1E\_6:** Both agencies deny (0) that the legal framework specifies criteria for external data suppliers, associating this with L=3.
- 1\_1E\_7a, 1\_1E\_7b, 1\_1E\_7c:** Both agencies deny (0) established monitoring processes for data collection, processing, and dissemination, linking all denials to L=3.

### Key Contradictions

PPD denies mandates (1\_1E\_1, 1\_1E\_2) but links operations to L=3, reflecting weak alignment between mandate acknowledgment and ministry-level responsibilities. Both agencies deny penalties (1\_1E\_4) and monitoring processes (1\_1E\_7a, 1\_1E\_7b, 1\_1E\_7c), despite linking these denials to ministry-level operations (L=3), revealing a lack of enforcement and oversight mechanisms. GovTech denies data integration (1\_1E\_5) despite its alignment with ministry-level operations (L=3), contradicting its broader policy focus.

### Recommendations

Both agencies must improve their understanding and implementation of EMIS mandates. GovTech should strengthen its focus on penalties, monitoring processes, and data integration to operationalize its ministry-level policy awareness. PPD must align its operational practices with mandates, especially for comprehensive data standards (1\_1E\_1) and test administration processes (1\_1E\_2). Structured training, role clarification, and the establishment of enforcement mechanisms are critical to ensuring consistent compliance and monitoring across all levels.

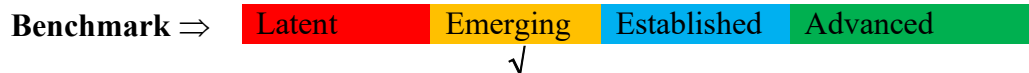
**Table 1.10**

#### *SWOT Analysis for Comprehensive Quality Data*

Strength	Weakness
GovTech affirms critical mandates for comprehensive data standards and test administration processes, showing ministry-level policy engagement.	Both agencies deny penalties, monitoring processes, and supplier criteria, indicating significant gaps in enforcement and oversight.
Opportunities	Threats
Training and role clarification can help operationalize mandates, particularly for penalties, monitoring, and data integration.	Weak enforcement and monitoring could undermine the credibility of the EMIS framework and the quality of education data.

### 1.3.6 Data Sharing and Coordination

Standard: The legal framework allows for adequate data sharing and coordination between the Ministry of Education and agencies and/or institutions that require education data.



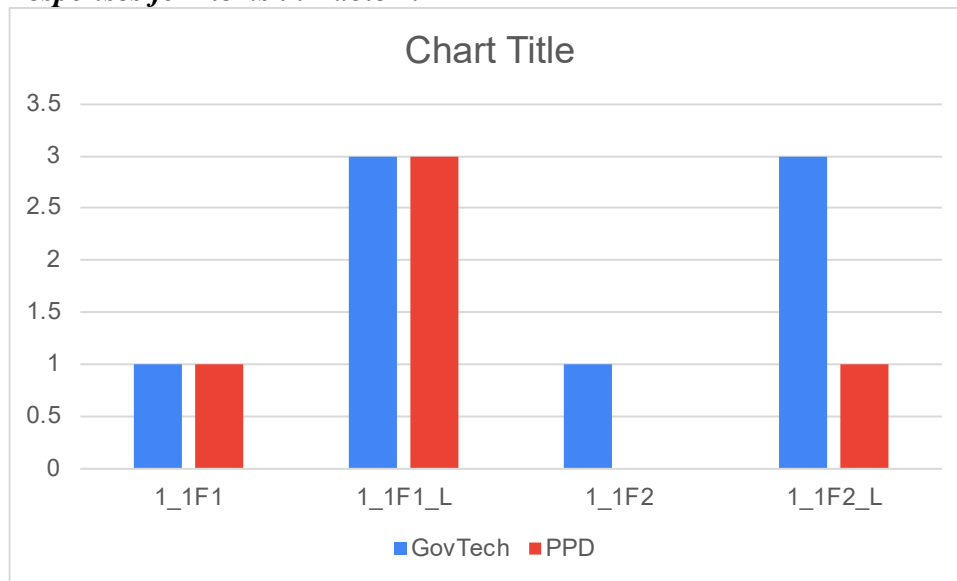
Data sharing and coordination mechanisms are acknowledged at the Ministry level, but significant gaps remain at operational levels, particularly with PPD’s engagement. Some coordination exists, but procedural frameworks are unclear, and there is limited training or awareness at sub-national levels.

GovTech demonstrates policy-level alignment, affirming centralized data-sharing mandates (1\_1F1, 1\_1F2). However, PPD’s denial of timely data-sharing requirements (1\_1F2) and inconsistent school-level engagement reflect weak alignment with the legal framework. Improved training, role clarification, and dzongkhag-level coordination are required to advance to the “Established” level.

**Table 1.11**  
**Items Measuring Data Sharing and Coordination**

Item	Statement
1_F1	Does the legal framework spell out the processes to share data with agencies/institutions outside of the EMIS?
1_1F2	Is there a law that outlines the requirement that data needs to be shared on a timely basis with education stakeholders (e.g., parents, teachers, schools, policymakers, etc.)?

**Figure 1.6**  
**Responses for Items in Table 1.11**



### General Trends

GovTech demonstrates stronger alignment with the legal framework for data sharing and coordination, affirming both items 1\_1F1 and 1\_1F2. GovTech links both items to the ministry level (L=3), indicating a focus on policy-level processes. PPD affirms item 1\_1F1, associating it with L=3, but denies item 1\_1F2, tying it to L=1, indicating inconsistency between operational involvement and mandate recognition.

### Item-by-Item Analysis

**1\_1F1:** Both GovTech and PPD affirm (1) that the legal framework includes processes for data sharing with external agencies/institutions. Both link this response to ministry-level operations (L=3), reflecting consensus on the need for centralized data sharing mechanisms.

**1\_1F2:** GovTech affirms (1) the requirement for timely data sharing with education stakeholders and associates it with L=3, indicating alignment at the policy level. PPD denies (0) this requirement but links its response to L=1, reflecting a contradiction between its operational association and recognition of the legal mandate.

### Key Contradictions

PPD denies the requirement for timely data sharing with stakeholders (1\_1F2) but links this response to L=1, reflecting operational involvement without mandate acknowledgment. Both agencies affirm centralized processes for external data sharing (1\_1F1) at L=3 but diverge in their responses to 1\_1F2, with PPD failing to align its operational role with policy mandates. The absence of engagement at the dzongkhag level (L=2) indicates a potential gap in regional coordination and data-sharing processes.

### Recommendations

GovTech and PPD must ensure role clarity and consistent alignment between operational activities and policy mandates. PPD should address its denial of item 1\_1F2 by recognizing the requirement for timely data sharing and aligning its school-level activities with this mandate. Both agencies should enhance coordination at the dzongkhag level to bridge gaps in regional data sharing. Training on legal mandates and clear communication channels across all levels of operation will ensure consistency and improve institutionalization.

**Table 1.12**  
*SWOT Analysis for Data Sharing and Coordination*

Strength	Weakness
GovTech demonstrates strong alignment with centralized data-sharing mandates at the ministry level (L=3).	PPD’s denial of timely data-sharing requirements (1_1F2) and limited engagement at the dzongkhag level indicate weak coordination across operational levels.
Opportunities	Threats
Introducing training programs and improving regional coordination can enhance data-sharing consistency and compliance.	Misalignment between operational roles and legal mandates may undermine effective data sharing and stakeholder trust.

### 1.3.7 Utilization

Standard: The legal framework emphasizes data-driven education policy.



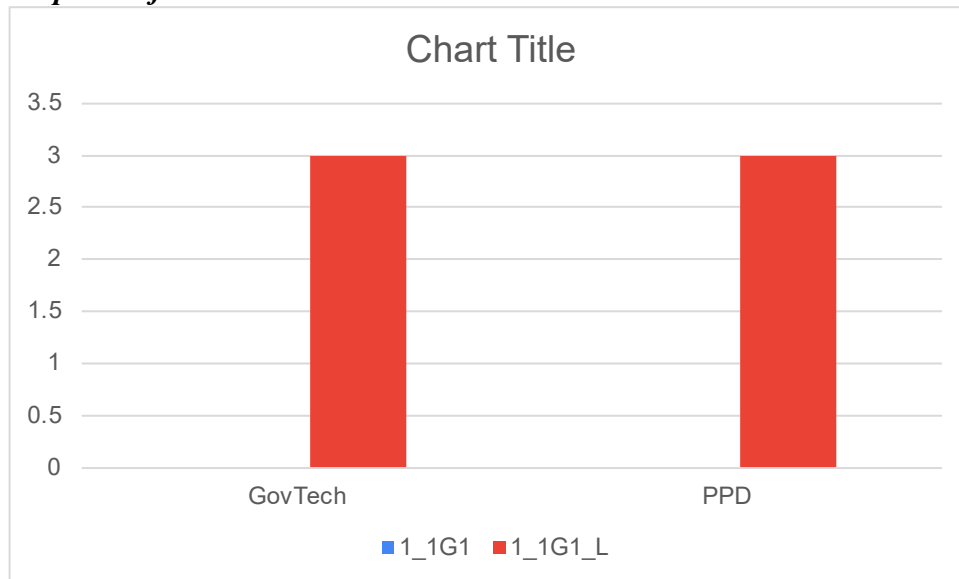
There is no formal legal framework exists to specify the utilization of data for policymaking.

While both agencies recognize the central role of the ministry (L=3) in data-driven policymaking, the absence of a legal framework hinders the institutionalization of data utilization processes. Establishing a formal framework, along with capacity-building initiatives and clear accountability mechanisms, is essential for progress toward the “Emerging” or “Established” levels.

**Table 1.13**  
*Items Measuring Utilization*

Item	Statement
1_G1	Does the legal framework specify how data in the EMIS is going to be utilized (i.e., framework outlines that education policies should be informed by EMIS data and decision-making is data-driven)?

**Figure 1.7**  
**Responses for Items in Table 1.13**



### General Trends

Both GovTech and PPD deny (0) that the legal framework specifies how data in the EMIS should be utilized to inform education policies and ensure data-driven decision-making (1\_1G1). Despite this denial, both agencies link their responses to the ministry level (L=3), indicating an acknowledgment that policy-related data utilization is primarily a central-level responsibility.

### Item-by-Item Analysis

For item 1\_1G1, both GovTech and PPD deny (0) the presence of a legal framework outlining the use of EMIS data for education policies and decision-making. Both responses are associated with L=3, suggesting that while the agencies recognize the ministry as the focal point for policy-level data utilization, the absence of a legal framework creates a significant gap in formalizing data-driven decision-making processes.

### Key Contradictions

The main contradiction lies in the acknowledgment of the ministry (L=3) as the responsible level for policy-related data utilization, while simultaneously denying (0) the existence of a legal framework to guide such processes. This reveals a gap between the recognition of centralized data-driven policymaking responsibilities and the absence of formal structures or mandates to support these activities.

### Recommendations

To address these gaps, a legal framework should be established to explicitly outline how EMIS data will inform education policies and decision-making. This framework should specify the roles and responsibilities of different levels of operation, particularly the ministry (L=3), in ensuring data is systematically integrated into policy development. Additionally, capacity-building initiatives should be implemented to develop the skills and processes required for data-driven decision-making, complemented by regular reviews to monitor the framework's effectiveness.

**Table 1.14**  
*SWOT Analysis for Utilization*

<b>Strength</b>	<b>Weakness</b>
Both agencies recognize the ministry level (L=3) as the appropriate operational level for data-driven policymaking.	The absence of a legal framework formalizing the use of EMIS data for policy development limits institutionalization and accountability.
<b>Opportunities</b>	<b>Threats</b>
Developing a legal framework and associated processes for data utilization provides an opportunity to strengthen evidence-based policymaking in education.	Without formal guidance, the reliance on EMIS data for policymaking may remain inconsistent, reducing the impact of education reforms.

### 1.3.8 Budget

Standard: The education system budget includes a line item for the EMIS.

Benchmark ⇒ Latent Emerging Established Advanced

√

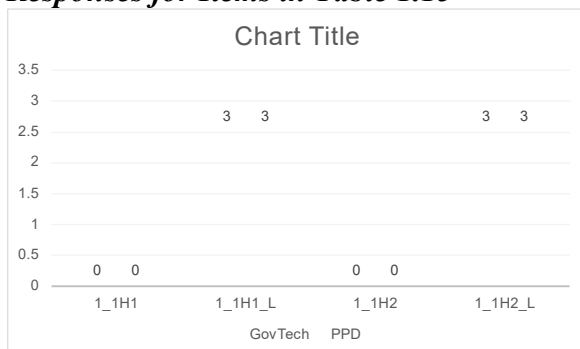
There are no formal provisions or dedicated budget lines for EMIS.

Both agencies recognize the ministry’s role (L=3) in financial planning for the EMIS but deny the existence of formal budgetary processes or legal mandates. Establishing a dedicated budget line item and embedding financial planning in legal frameworks are critical to advancing to the “Emerging” or “Established” levels.

**Table 1.15**  
*Items Measuring Budget*

Item	Statement
1_1H1	Does the education system's budget include a line item for the EMIS?
1_1H2	Does the legal framework specify a budget for each of the budgetary items of the EMIS outlined in Lever 1.5?

**Figure 1.8**  
*Responses for Items in Table 1.15*



## General Trends

Both GovTech and PPD deny (0) that the education system’s budget includes a specific line item for the EMIS (1\_1H1) and that the legal framework specifies a budget for EMIS-related items (1\_1H2). Despite these denials, both agencies associate their responses with ministry-level operations (L=3), indicating recognition of centralized responsibility for budgetary planning and legal mandates related to the EMIS.

## Item-by-Item Analysis

**1\_1H1:** Both agencies deny (0) that the education system’s budget includes a dedicated line item for the EMIS, linking this response to L=3. This reflects a lack of formalized financial commitment at the ministry level to support EMIS operations.

**1\_1H2:** Both agencies deny (0) that the legal framework specifies budgets for EMIS-related items outlined in Lever 1.5, associating this with L=3. This highlights the absence of legal mandates to ensure funding allocation for key EMIS components.

## Key Contradictions

The key contradiction lies in the acknowledgment of the ministry (L=3) as the operational level responsible for budgetary and legal processes for the EMIS, while simultaneously denying (0) the presence of a line item in the budget (1\_1H1) and the existence of a legal framework for budget allocation (1\_1H2). This discrepancy highlights a gap between recognized responsibility and actual implementation or institutionalization.

## Recommendations

The education system must establish a formal budgetary framework that includes a dedicated line item for the EMIS. This should be supported by a legal framework that specifies funding allocations for key EMIS components, as outlined in Lever 1.5. The ministry (L=3) should lead the institutionalization of these processes, ensuring transparency and accountability in EMIS funding. Capacity-building efforts and advocacy for the importance of EMIS in policy and planning can further support sustained financial commitment.

**Table 1.16**

### ***SWOT Analysis for Budget***

<b>Strength</b>	<b>Weakness</b>
Both agencies recognize the ministry level (L=3) as the central authority for EMIS budget planning and legal framework development.	The absence of a dedicated budget line item and legal mandates for EMIS funding limits financial sustainability and operational effectiveness.
<b>Opportunities</b>	<b>Threats</b>
Developing a formal budgetary framework and embedding it in legal mandates can strengthen financial planning and institutionalization of the EMIS.	Without dedicated funding and legal support, EMIS operations may face challenges in sustainability and scalability, undermining its role in data-driven education planning.

### 1.3.9 Confidentiality

Standard: The legal framework guarantees that respondents' data are confidential and used for the sole purpose of statistics.

Benchmark ⇒ Latent Emerging Established Advanced



At the **Emerging** level, there is a foundational framework for data confidentiality, but it requires significant improvements in specificity, enforcement, and dissemination to ensure comprehensive protection and alignment across all levels of operation.

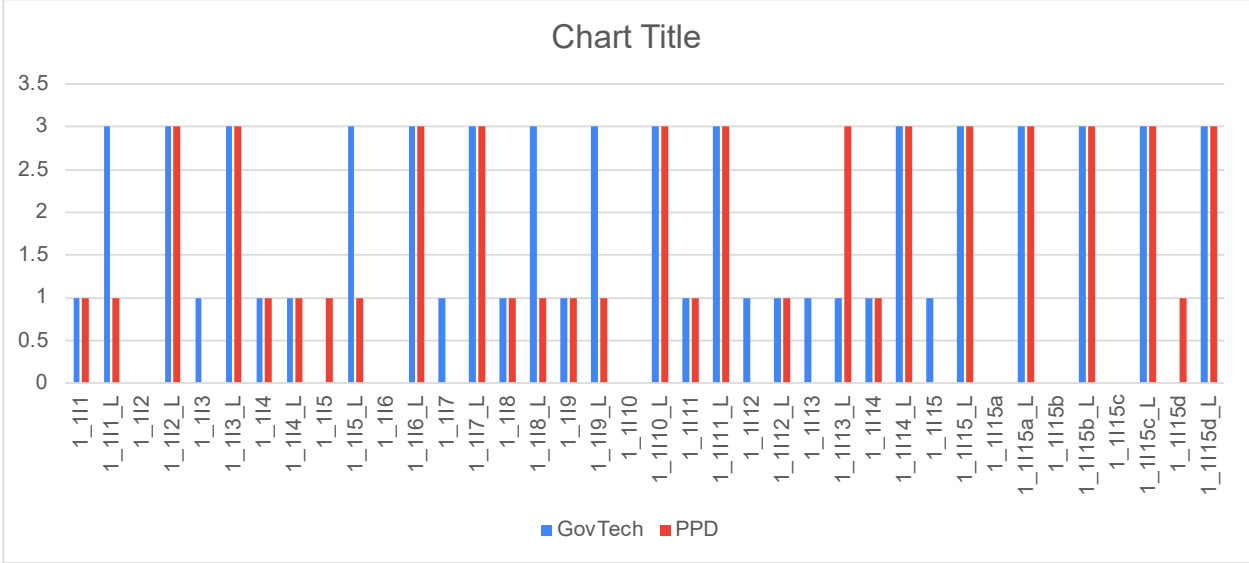
While GovTech shows relatively strong alignment with confidentiality provisions, critical gaps remain in penalties, conditions for disclosure, and school-specific safeguards. PPD exhibits inconsistencies between its operational role and recognition of legal mandates. Strengthening the framework and aligning roles with responsibilities are essential to progress toward the “Established” level.

**Table 1.17**  
*Items Measuring Confidentiality*

Item	Statement
1_1I1	Is there a law that ensures that respondents’ data is kept secure and protected from inappropriate access or unauthorized use?
1_1I2	If so, does the law outline penalties for disclosing confidential information?
1_1I3	Does a law exist that outlines specific actions to ensure confidentiality of respondents’ data?
1_1I4	Is the confidentiality of data widely known by respondents?
1_1I5	Does a law exist to safeguard information provided by the schools?
1_1I6	Does a law exist which guarantees confidentiality of data collected from the school (e.g., teacher evaluation data, student behavior) and details the specific uses of data collected from the school?
1_1I7	Does a law specify that respondents are required to provide a truthful response?
1_1I8	If so, are respondents informed of their obligation to provide a truthful response?
1_1I9	Does a law specify when and how to remove student records (e.g., they no longer serve education purposes)?
1_1I10	Are there clearly stated penalties against EMIS staff that disclose confidential data for purposes other than the intended use?
1_1I11	Is the overall legal framework for collecting, managing and disseminating education statistics consistent with national freedom of information laws?
1_1I12	Does a law outline student rights in accessing and handling his or her personal records?
1_1I13	Does the legal framework outline rights of parents/guardians in accessing and handling student records?
1_1I14	Does the legal framework outline the process for correcting/updating student records?

1_1I15	Does the legal framework outline conditions for disclosure of information? Does it include the following:
1_1I15a	Limitations on redisclosure?
1_1I15b	Conditions for disclosure to officials of other schools and school systems?
1_1I15c	Disclosure to certain federal and state officials for federal program purposes?
1_1I15d	Conditions for disclosure in emergencies?

**Figure 1.9**  
*Responses for Items in Table 1.17*



**General Trends**

GovTech exhibits stronger alignment with confidentiality and data protection in the legal framework, affirming 11 of the items, while PPD affirms only 8. Both agencies associate most responses with the ministry level (L=3), reflecting centralized responsibility for managing and safeguarding data confidentiality. PPD demonstrates lower recognition of legal provisions related to penalties, safeguards, and the rights of respondents or schools, despite associating these items with operations at L=1 or L=3.

**Item-by-Item Analysis**

- 1\_1I1:** Both GovTech and PPD affirm (1) that a law ensures respondents’ data is secure and protected from unauthorized use, linking it to L=3 and L=1, respectively.
- 1\_1I2:** Both agencies deny (0) that the law outlines penalties for disclosing confidential information, linking this gap to L=3.
- 1\_1I3:** GovTech affirms (1) that specific actions to ensure confidentiality are outlined in the law, while PPD denies this (0); both link their responses to L=3.
- 1\_1I4:** Both agencies affirm (1) that data confidentiality is widely known among respondents, associating this with L=1.

- 1\_1I5:** GovTech denies (0) that the law safeguards information provided by schools, while PPD affirms (1), linking responses to L=3 and L=1, respectively.
- 1\_1I6:** Both agencies deny (0) that a law guarantees the confidentiality of school data and its specific uses, associating this with L=3.
- 1\_1I7:** GovTech affirms (1) that respondents are legally required to provide truthful responses, while PPD denies this (0); both link responses to L=3.
- 1\_1I8:** Both agencies affirm (1) that respondents are informed of their obligation to provide truthful responses, associating this with L=3 and L=1.
- 1\_1I9:** Both agencies affirm (1) that a law specifies when and how to remove student records, linking this to L=3 and L=1.
- 1\_1I10:** Both agencies deny (0) the existence of penalties for EMIS staff who disclose confidential data, associating this gap with L=3.
- 1\_1I11:** Both agencies affirm (1) that the legal framework aligns with national freedom of information laws, associating this with L=3.
- 1\_1I12 & 1\_1I13:** GovTech affirms (1) that laws outline student and parental rights for accessing and managing records, while PPD denies this (0); both link responses to L=1 or L=3.
- 1\_1I14:** Both agencies affirm (1) that the law outlines processes for updating student records, associating this with L=3.
- 1\_1I15:** GovTech affirms (1) that conditions for disclosure are outlined in the law, while PPD denies this (0); both associate this with L=3.
- 1\_1I15a-c:** Both agencies deny (0) the inclusion of detailed conditions for redisclosure, disclosure to officials, federal purposes, or emergencies, associating all gaps with L=3.
- 1\_1I15d:** GovTech denies this item, but PPD acknowledges it.

**Key Contradictions**

PPD denies the existence of several legal provisions (e.g., 1\_1I3, 1\_1I7, 1\_1I13) despite associating these with operational activities at L=1, reflecting a lack of alignment between recognition of responsibilities and legal mandates. Both agencies affirm broader framework alignment with national laws (1\_1I11) while denying detailed conditions for disclosure (1\_1I15a-d), indicating gaps in the specificity of the legal framework. GovTech’s denial of safeguards for school data (1\_1I5, 1\_1I6) contrasts with its broader recognition of confidentiality-related legal provisions, highlighting a potential oversight in addressing school-specific needs.

**Recommendations**

The legal framework should be strengthened to explicitly address penalties for unauthorized disclosure, detailed conditions for data sharing and disclosure, and safeguards for school-provided data. GovTech and PPD should align operational roles with legal mandates to eliminate inconsistencies, particularly at the school level. A communication campaign should ensure that all stakeholders understand existing provisions for data confidentiality, and capacity-building initiatives should reinforce adherence to the framework at all levels of operation.

**Table 1.18**  
***SWOT Analysis for Confidentiality***

<b>Strength</b>	<b>Weakness</b>
GovTech demonstrates strong alignment with the legal framework for confidentiality, affirming several provisions at the ministry level (L=3).	Both agencies fail to recognize detailed conditions for disclosure and penalties for unauthorized use, limiting enforcement mechanisms.

Opportunities	Threats
Expanding the legal framework to include specific safeguards and detailed conditions for disclosure can strengthen trust and compliance.	Inconsistent alignment between legal mandates and operational roles may undermine stakeholder confidence and the effectiveness of the confidentiality framework.

## 1.4 Organizational Structure and Institutional Processes

General Standard: The system is institutionalized within the government, has well-defined organizational processes, and has several functionalities beyond statistical reporting.

Benchmark ⇒



The system has a clearly defined organizational structure with well-established processes, particularly at the Ministry level. However, some gaps still exist at the lower operational levels (L1 and L2), such as lack of process documentation and periodic reviews. This shows that while there is some institutionalization, the system is not yet fully decentralized or uniformly implemented across all levels.

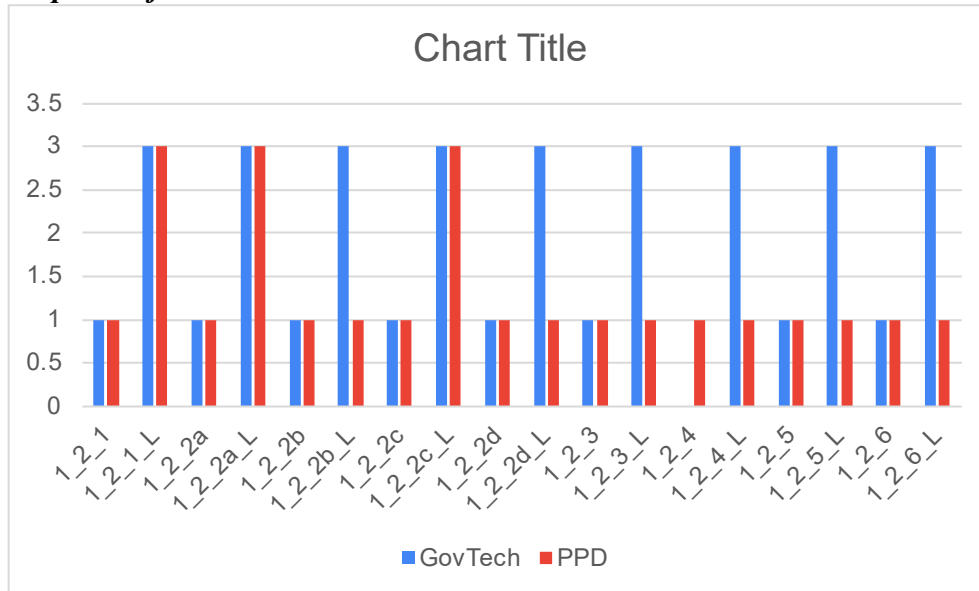
Both agencies demonstrate strong alignment with policies and processes supporting EMIS institutionalization. However, GovTech’s denial of documented processes (1\_2\_4) and limited recognition of decentralized roles indicate areas for improvement. Recording processes in a comprehensive document and ensuring alignment across levels will help achieve an “Advanced” level.

**Table 1.19**

***Items Measuring Organizational Structure and Institutional Processes***

Item	Statement
1_2_1	Is there a policy that outlines the need for an organizational structure and institutional processes within the EMIS?
1_2_2	Is the institutional structure of the EMIS a well-defined unit that includes:
1_2_2a	A mission statement?
1_2_2b	A hierarchical structure?
1_2_2c	A structured workflow?
1_2_2d	Designated staff roles and responsibilities?
1_2_3	Are there institutionalized processes in an EMIS that allow for the effective flow of information?
1_2_4	Are the institutionalized processes of an EMIS recorded in a document (e.g., operations manual, handbook)?
1_2_5	Are working processes periodically reviewed to ensure that they are efficient and are subsequently improved, as needed?
1_2_6	Are the core tasks of the EMIS at all levels of the process identified?

**Figure 1.10**  
**Responses for Items in Table 1.19**



**General Trends**

Both GovTech and PPD display strong alignment with the institutionalization of the EMIS, affirming most items. GovTech affirms (1) all items except 1\_2\_4, indicating that the institutionalized processes of the EMIS are not fully recorded in a document. PPD similarly affirms most items but provides more diverse levels of operation, associating some responses with L=1 (school level) while GovTech primarily links responses to L=3 (ministry level). This reflects GovTech’s centralized focus and PPD’s broader recognition of school-level involvement.

**Item-by-Item Observations**

- 1\_2\_1:** Both agencies affirm (1) the existence of a policy outlining organizational structure and processes within the EMIS, associating this with L=3.
- 1\_2\_2a–1\_2\_2d:** Both agencies affirm (1) the existence of a mission statement, hierarchical structure, structured workflow, and designated staff roles, linking responses primarily to L=3. However, PPD associates hierarchical structure (1\_2\_2b) and staff roles (1\_2\_2d) with L=1 as well, indicating involvement at the school level.
- 1\_2\_3:** Both agencies affirm (1) the presence of institutionalized processes for effective information flow, but PPD links this to L=1 while GovTech ties it to L=3.
- 1\_2\_4:** GovTech denies (0) that institutionalized processes are recorded in a document, associating this gap with L=3, while PPD affirms (1) and links it to L=1.
- 1\_2\_5:** Both agencies affirm (1) that working processes are periodically reviewed and improved as needed, associating this with L=3.
- 1\_2\_6:** Both agencies affirm (1) that core EMIS tasks are identified at all levels of the process, linking this to L=3 and L=1, respectively.

## Key Contradictions

The most notable contradiction lies in 1\_2\_4, where GovTech denies (0) that institutionalized processes are recorded in a document at L=3, while PPD affirms (1) this provision at L=1. This indicates a lack of alignment in recognizing the documentation of processes. Additionally, GovTech consistently associates processes with L=3, while PPD recognizes school-level involvement (L=1) in items like hierarchical structure (1\_2\_2b), staff roles (1\_2\_2d), and information flow (1\_2\_3), suggesting discrepancies in the perceived distribution of responsibilities.

## Recommendations

GovTech and PPD should align their understanding of the documentation of EMIS processes (1\_2\_4) by collaboratively ensuring that institutionalized workflows are recorded in a central document accessible to all levels of operation. Efforts should also focus on strengthening recognition of the dzongkhag level's role in EMIS processes and ensuring alignment in the distribution of responsibilities across all levels. Periodic reviews and updates of processes should be institutionalized with clear documentation to improve transparency and operational efficiency.

**Table 1.20**

### *SWOT Analysis for Organizational Structure and Institutional Processes*

<i>Strength</i>	<i>Weakness</i>
Both agencies affirm the existence of policies, organizational structures, and institutional processes, demonstrating strong foundational alignment for EMIS operations.	GovTech's denial of recorded processes (1_2_4) and limited recognition of school-level involvement highlight gaps in documentation and decentralized implementation.
<i>Opportunities</i>	<i>Threats</i>
Documenting institutionalized processes and recognizing the role of all levels (L=1, L=2, and L=3) can enhance operational clarity and accountability.	Misalignment in recognizing documentation and operational roles risks inefficiencies and inconsistencies in EMIS processes across levels.

## 1.5 Human Resources

General Standard: Qualified staff operate the system, and opportunities are available to improve their performance and retention.

### 1.5.1 Personnel

Standard: The core tasks of the EMIS are identified, and the EMIS is staffed with qualified people.

Benchmark ⇒ Latent Emerging Established Advanced

√

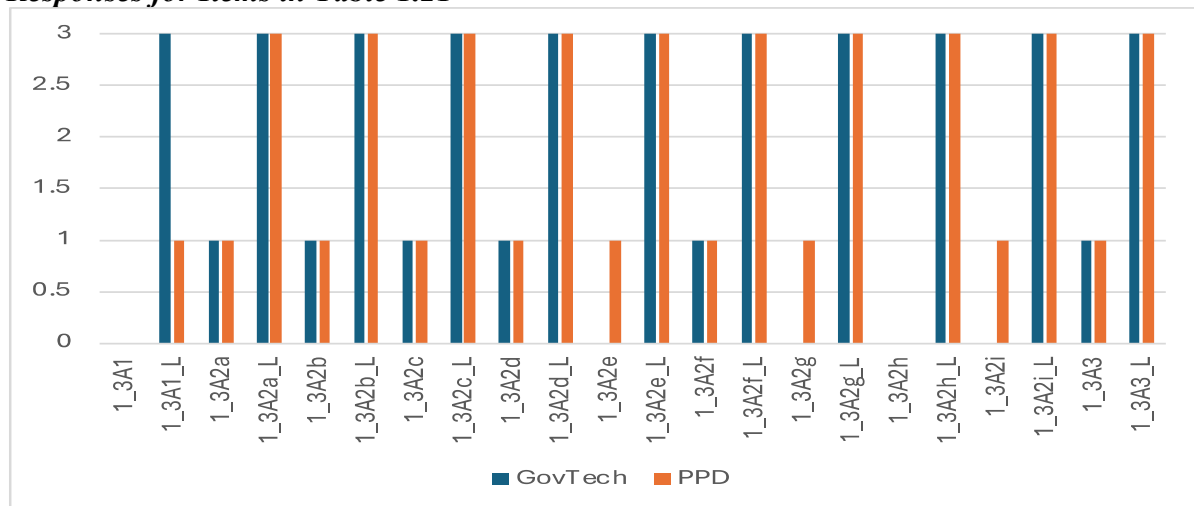
At the **Emerging** level, there is evidence of basic staffing in critical operational areas, but the absence of a guiding policy, gaps in technical expertise, and limited decentralization hinder full institutionalization. Progress to higher levels requires establishing a comprehensive policy, addressing technical staffing gaps, and ensuring alignment across all operational levels (L=1, L=2, and L=3).

While both agencies recognize the presence of qualified staff in several key areas, the lack of a guiding policy and gaps in technical staffing indicate incomplete institutionalization. Establishing a comprehensive policy, addressing technical gaps, and decentralizing staffing responsibilities will help progress to the “Established” level.

**Table 1.21**  
*Items Measuring Personnel*

Item	Statement
1_3A1	Is there a policy that outlines the need for qualified human resources within the EMIS?
1_3A2	Is the EMIS staffed with qualified people in the following areas:
1_3A2a	Planning (i.e., administrative staff support for the EMIS)?
1_3A2b	Evaluation (i.e., staff to monitor and evaluate the EMIS)?
1_3A2c	Education (i.e., staff skilled in understanding the data needs of the education system)?
1_3A2d	Communications (i.e. staff to produce communications and/or dissemination materials)?
1_3A2e	Data analytics (e.g., staff skilled in utilizing data analytic and statistical tools)?
1_3A2f	Statistics (e.g., statisticians)?
1_3A2g	Database architecture (e.g., staff to develop, maintain and amend the system as needed)?
1_3A2h	Computer engineering (e.g., staff to manage the EMIS data platform)?
1_3A2i	Information Technology (e.g., staff to ensure that information technologies operate)?
1_3A3	Is there an EMIS manager?

**Figure 1.11**  
*Responses for Items in Table 1.21*



**General Trends**

Both GovTech and PPD show partial alignment with the need for qualified human resources within the EMIS. They affirm the presence of qualified staff in key areas such as planning (1\_3A2a), evaluation (1\_3A2b), education expertise (1\_3A2c), communication (1\_3A2d), and statistics

(1\_3A2f). However, neither agency affirms the presence of qualified staff in computer engineering (1\_3A2h), and GovTech denies staff expertise in data analytics (1\_3A2e), database architecture (1\_3A2g), and information technology (1\_3A2i), while PPD affirms these areas. Both agencies deny the existence of a policy outlining the need for qualified human resources (1\_3A1). Most items are linked to ministry-level operations (L=3), reflecting a centralized staffing focus.

**Item-by-Item Observations**

- 1\_3A1:** Both agencies deny (0) that there is a policy outlining the need for qualified human resources within the EMIS, linking this gap to L=3 for GovTech and L=1 for PPD.
- 1\_3A2a–1\_3A2d:** Both agencies affirm (1) the presence of qualified staff in planning, evaluation, education expertise, and communication, associating these areas with L=3.
- 1\_3A2e:** GovTech denies (0) the presence of staff skilled in data analytics, while PPD affirms (1); both link responses to L=3.
- 1\_3A2f:** Both agencies affirm (1) the presence of statisticians, associating this with L=3.
- 1\_3A2g:** GovTech denies (0) the presence of staff for database architecture, while PPD affirms (1); both link responses to L=3.
- 1\_3A2h:** Both agencies deny (0) the presence of qualified staff in computer engineering, linking this gap to L=3.
- 1\_3A2i:** GovTech denies (0) while PPD affirms (1) the presence of staff in information technology, linking this to L=3.
- 1\_3A3:** Both agencies affirm (1) the existence of an EMIS manager, associating this with L=3.

**Key Contradictions**

A significant contradiction exists in 1\_3A2e (data analytics), 1\_3A2g (database architecture), and 1\_3A2i (information technology), where PPD affirms the presence of qualified staff while GovTech denies it, despite both associating responses with L=3. Similarly, both agencies affirm the existence of an EMIS manager (1\_3A3) at L=3 but deny the presence of a policy (1\_3A1) to guide human resource development, creating a gap in strategic planning for staffing. The lack of recognition for computer engineering staff (1\_3A2h) by both agencies is inconsistent with the broader affirmation of core EMIS tasks.

**Recommendation**

The government should establish a policy outlining the need for qualified human resources in the EMIS to address strategic gaps (1\_3A1). Both agencies should prioritize recruiting staff for computer engineering (1\_3A2h) and align their perspectives on data analytics (1\_3A2e), database architecture (1\_3A2g), and IT (1\_3A2i). Efforts should also focus on decentralizing staffing roles to include dzongkhag and school-level engagement, ensuring broader operational alignment. Clear documentation of roles and responsibilities, along with capacity-building initiatives, will enhance institutionalization.

**Table 1.22**  
*SWOT Analysis for Personnel*

Strength	Weakness
Both agencies affirm the presence of qualified staff in critical areas such as planning, evaluation, education expertise, communication, and statistics, along with the presence of an EMIS manager.	Neither agency recognizes a guiding policy for human resources, and gaps exist in recruiting staff for computer engineering, data analytics, and IT.

Opportunities	Threats
Establishing a policy for human resources and aligning staffing across all levels (L=1, L=2, L=3) can improve efficiency and institutionalization.	Without addressing staffing gaps in technical areas, the EMIS may face operational inefficiencies, undermining its effectiveness and sustainability.

## 1.5.2 Professional Development

Standard: Professional training is available for EMIS staff.

Benchmark ⇒ Latent Emerging Established Advanced

√

At the latent stage, professional training for EMIS staff is either non-existent or lacks structure and resources. The absence of training programs, professional development materials, and career progression systems leads to outdated skills and high staff turnover. Progressing beyond the latent level requires establishing systematic training, providing necessary resources, and institutionalizing these efforts across all operational levels.

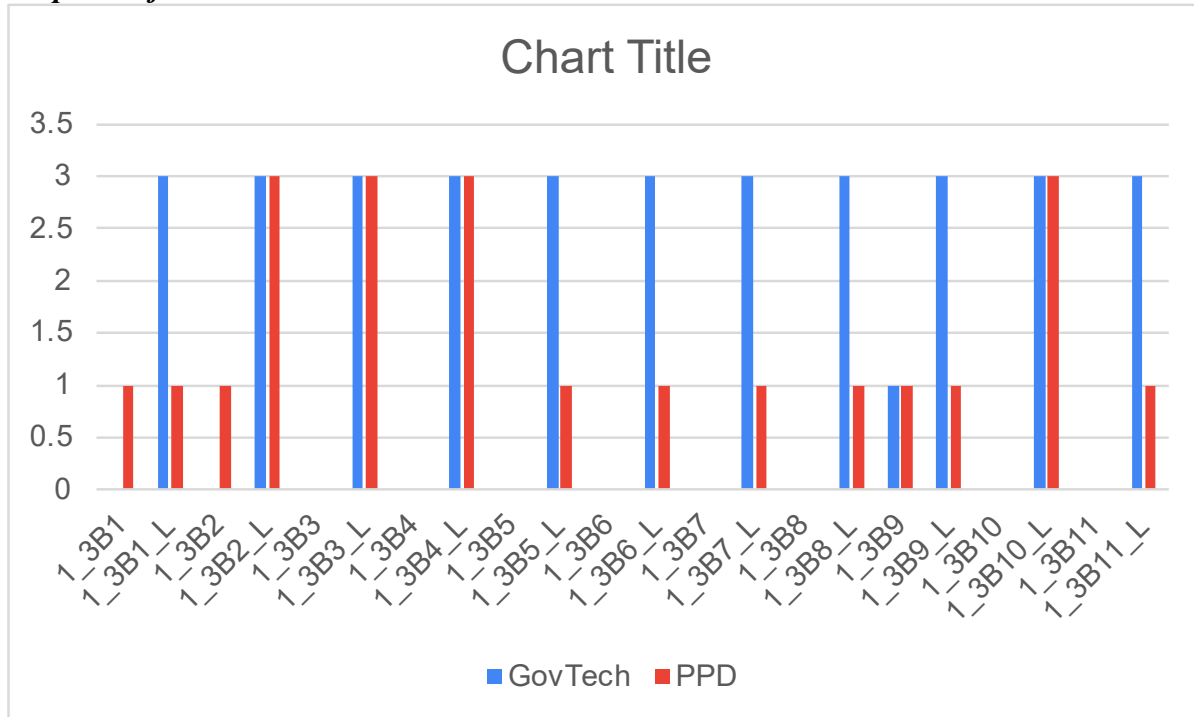
Both agencies highlight major gaps in training availability, resources, and retention strategies. While PPD recognizes some provisions, GovTech’s consistent denial and lack of alignment across operational levels indicate a nascent stage. Progressing to the “Emerging” level requires clear documentation of training policies, improved resource availability, and alignment between agencies.

**Table 1.23**

***Items Measuring Professional Development***

Item	Statement
1_3B1	Does training exist to strengthen the technical skills of EMIS staff?
1_3B2	Are the technical skills of staff up-to-date to be consistent with EMIS policies and technologies?
1_3B3	Are subject-specific courses available to strengthen the technical skills of EMIS staff?
1_3B4	Are professional development materials available for staff (e.g., resources on statistics, manuals for database management, etc.) and is human resources support provided for staff?
1_3B5	Are there training materials for capacity building to fulfill data management functions?
1_3B6	Are EMIS staff provided continuous on-the-job training?
1_3B7	If yes, how often are EMIS staff provided continuous on-the-job training? (include specifics in the comments section)
1_3B8	Are staff retained within the system?
1_3B9	Has there been a loss of major staff members in the last 1-3 years?
1_3B10	Is there an internal personnel evaluation system?
1_3B11	Is there a defined career path for EMIS staff?

**Figure 1.12**  
**Responses for Items in Table 1.23**



### General Trends

The data indicates significant gaps in professional training for EMIS staff as reported by both GovTech and PPD. GovTech denies (0) the existence of training, resources, and systems for professional development across most items, linking these gaps to the ministry level (L=3). PPD provides slightly more recognition, affirming (1) training for technical skills (1\_3B1, 1\_3B2) but denying other critical areas such as subject-specific courses (1\_3B3), professional development materials (1\_3B4), and continuous on-the-job training (1\_3B6). Both agencies acknowledge (1) the loss of major staff members in the past 1–3 years (1\_3B9), highlighting retention challenges.

### Item-by-Item Analysis

**1\_3B1–1\_3B2:** GovTech denies (0) the availability of technical training and up-to-date skills, associating these with L=3. PPD affirms (1) their availability, linking training for technical skills (1\_3B1) to L=1 and updated skills (1\_3B2) to L=3.

**1\_3B3–1\_3B4:** Both agencies deny (0) the availability of subject-specific courses and professional development materials, associating responses with L=3.

**1\_3B5:** GovTech denies (0) capacity-building training materials, while PPD links this gap to L=1.

**1\_3B6–1\_3B7:** Both agencies deny (0) continuous on-the-job training and training frequency, associating this with L=3 for GovTech and L=1 for PPD.

**1\_3B8:** Both agencies deny (0) that staff retention is sufficient, linking responses to L=3 for GovTech and L=1 for PPD.

**1\_3B9:** Both agencies affirm (1) the loss of major staff members in the past 1–3 years, associating this with L=3 for GovTech and L=1 for PPD.

**1\_3B10–1\_3B11:** Both agencies deny (0) the presence of an internal evaluation system and defined career path, linking these gaps to L=3 for GovTech and L=1 for PPD.

### Key Contradictions

A major contradiction exists in 1\_3B1 and 1\_3B2, where PPD affirms (1) the availability of training and updated skills while GovTech denies (0). Additionally, GovTech consistently denies (0) training materials (1\_3B4, 1\_3B5) and career development systems (1\_3B11), while PPD links some provisions to the school level (L=1). Both agencies agree on the loss of major staff members (1\_3B9), but neither reports adequate systems to address retention challenges, highlighting gaps in alignment.

### Recommendations

Both agencies should collaborate to establish comprehensive training programs for EMIS staff, focusing on technical skills, subject-specific courses, and capacity building. A centralized framework should document training materials and professional development pathways, ensuring accessibility across ministry, dzongkhag, and school levels. Implementing an internal evaluation system and defined career paths will improve staff retention and align training with organizational goals. Consistent monitoring and alignment between GovTech and PPD are essential to address gaps and enhance training effectiveness.

**Table 1.24**

#### *SWOT Analysis for Professional Development*

Strength	Weakness
PPD acknowledges some training provisions and links training needs to school-level operations, reflecting decentralized awareness.	GovTech denies most training provisions, and both agencies report significant gaps in professional development materials and career progression systems
Opportunities	Threats
Establishing a centralized and well-documented training framework with decentralized implementation can improve skill development and staff retention.	The lack of training resources, career paths, and evaluation systems risks skill gaps and turnover, undermining EMIS functionality.

## 1.6 Infrastructural Capacity

General Standard: The system has a well-defined infrastructure to perform data collection, management, and dissemination functions in an integral manner.

### 1.6.1 Data Collection Means

Standard: Tools for data collection are available.

Benchmark ⇒



At the latent stage, tools for data collection are sporadic and unsupported by a formalized framework. There is no institutionalized approach to ensuring the availability or consistency of data collection tools. Advancing beyond this stage requires the establishment of policies, alignment across operational levels, and enhanced inter-agency coordination.

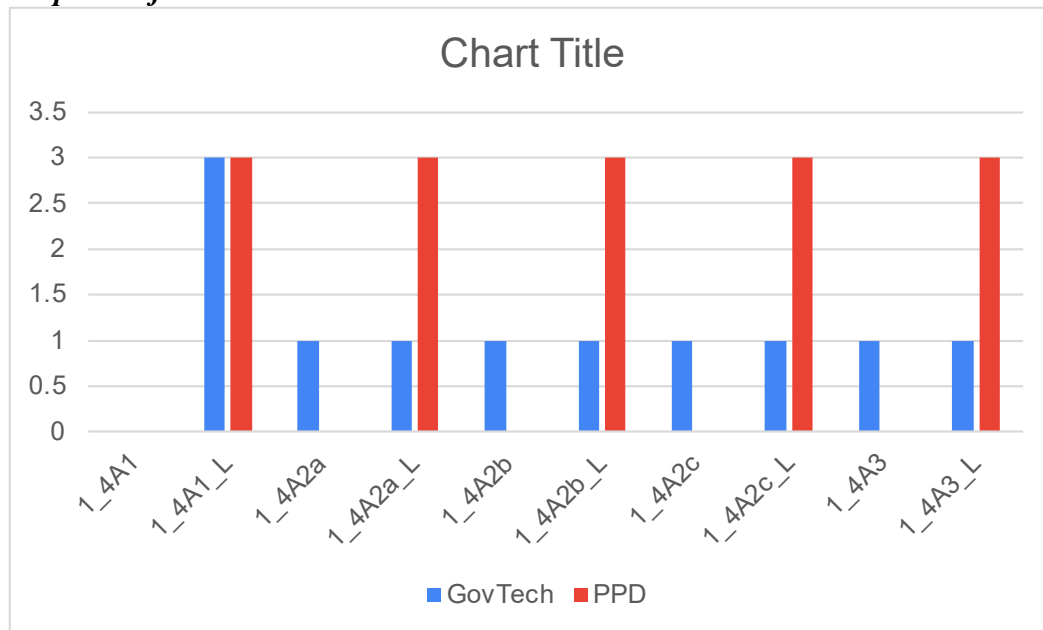
Although GovTech recognizes tools for data collection at the school level, the lack of a formalized policy (1\_4A1) and PPD's denial of tool availability indicate limited institutionalization. To

progress, it is necessary to establish a clear policy, enhance inter-agency alignment, and ensure consistent tool usage across all operational levels.

**Table 1.25**  
*Items Measuring Data Collection Means*

Item	Statement
1_4A1	Is there a policy that outlines the need for well-defined infrastructural capacity within the EMIS (e.g. hardware, software)?
1_4A	Does data collection occur at the school-level from both hardware and software technological means via:
1_4A2a	School censuses?
1_4A2b	School-specific management databases?
1_4A2c	Managerial documents?
1_4A3	Do tools exist for data collection (including collection by technological and/or non-technological means)?

**Figure 1.13**  
*Responses for Items in Table 1.25*



### General Trends

GovTech recognizes the availability of tools for data collection, particularly through school censuses (1\_4A2a), school-specific management databases (1\_4A2b), and managerial documents (1\_4A2c), affirming (1) all related items and linking them primarily to the school level (L=1). Conversely, PPD denies (0) all items, associating responses with the ministry level (L=3). Neither agency acknowledges the existence of a policy that defines infrastructural capacity for EMIS (1\_4A1), highlighting a lack of a formalized framework for data collection tools.

### Item-by-Item Analysis

**1\_4A1:** Both GovTech and PPD deny (0) the existence of a policy outlining infrastructural capacity for EMIS, associating responses with L=3, indicating the need for policy-level intervention.

**1\_4A2a:** GovTech affirms (1) that school censuses are used as a tool for data collection, linking this to L=1. PPD denies (0), associating the response with L=3.

**1\_4A2b:** GovTech affirms (1) the use of school-specific management databases for data collection at L=1, while PPD denies (0) at L=3.

**1\_4A2c:** GovTech affirms (1) the use of managerial documents for data collection at L=1, while PPD denies (0) at L=3.

**1\_4A3:** GovTech affirms (1) the availability of tools for data collection, linking the response to L=1. PPD denies (0), associating this with L=3.

### Key Contradictions

The most notable contradiction is in the recognition of tools for data collection (1\_4A3). While GovTech affirms (1) their availability at L=1, PPD denies (0) their existence and associates the gap with L=3. Similarly, GovTech links school-specific data collection tools like censuses (1\_4A2a), databases (1\_4A2b), and documents (1\_4A2c) to school-level operations, while PPD denies their availability entirely. The absence of a policy for infrastructural capacity (1\_4A1) is a shared gap across both agencies.

### Recommendations

To address the gaps, a policy should be developed to formally outline infrastructural capacity requirements for data collection within the EMIS, ensuring alignment between technological and non-technological tools across all operational levels. This policy should clarify roles and responsibilities at the school, dzongkhag, and ministry levels, fostering coherence between GovTech and PPD. Regular assessments and inter-agency collaboration are essential to reconcile discrepancies and enhance the availability and usage of data collection tools.

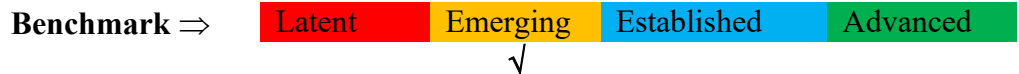
**Table 1.26**

#### *SWOT Analysis for Data Collection Means*

Strength	Weakness
GovTech recognizes a range of tools for data collection at the school level, highlighting the availability of practical means such as censuses, databases, and documents.	Both agencies fail to recognize a policy for infrastructural capacity, and PPD denies the availability of tools entirely, indicating a fragmented approach.
Opportunities	Threats
Establishing a formal policy on infrastructural capacity and fostering inter-agency collaboration can standardize data collection tools across levels.	The absence of a unified framework risks misalignment between agencies and operational levels, potentially compromising the quality and comprehensiveness of data collection.

### 1.6.2 Database (s)

Standard: Databases exist under the umbrella of the data warehouse and have both hardware and software.



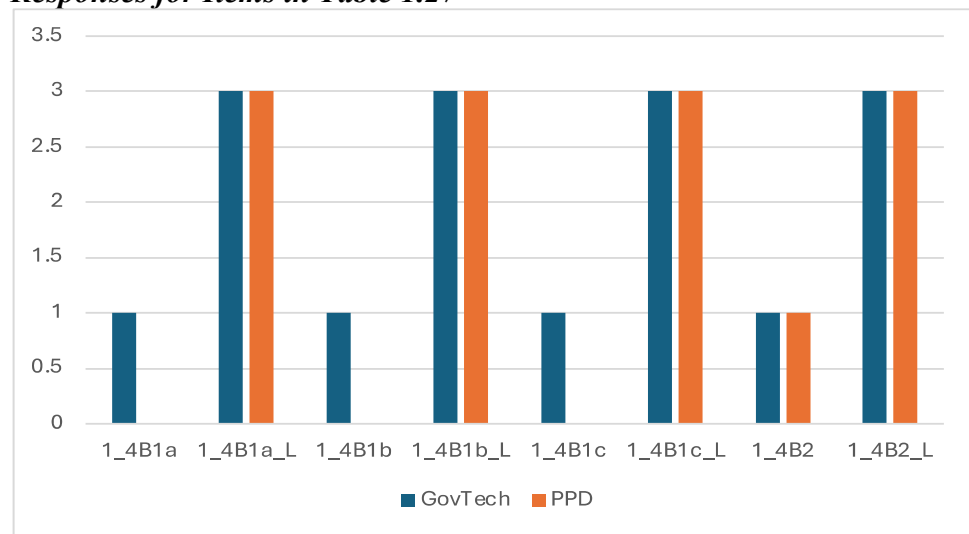
At the emerging stage, databases under the data warehouse exhibit some foundational functionalities, but their usage is fragmented and centralized. Policies are present but require refinement, and agency coordination is insufficient for full alignment. Advancing to the next level requires decentralizing operations, enhancing inter-agency collaboration, and strengthening policies to ensure consistent and comprehensive implementation across all levels.

While GovTech recognizes database functionalities, PPD denies their availability, and both agencies limit their recognition to the ministry level (L=3). The agreement on a policy for database archiving reflects progress but highlights a need for further institutionalization and decentralization. Moving to an Established level requires alignment between agencies and operationalization across all levels.

**Table 1.27**  
*Items Measuring Database*

Item	Statement
1_4B	Does the education information system databases contain both hardware and software technological means for:
1_4B1a	Data collection?
1_4B1b	Data management?
1_4B1c	Data dissemination?
1_4B2	Does a policy exist to ensure that databases are archived on computer servers?

**Figure 1.14**  
*Responses for Items in Table 1.27*



**General Trends**

The responses indicate significant differences between GovTech and PPD regarding the recognition of database functionalities. GovTech affirms (1) that the education information system databases support hardware and software for data collection, management, and dissemination

(1\_4B1a–1\_4B1c), associating all responses with the ministry level (L=3). PPD denies (0) these functionalities, also linking them to L=3. Both agencies agree (1) that a policy exists to ensure that databases are archived on computer servers (1\_4B2), associating this with L=3.

### Item-by-Item Analysis

**1\_4B1a:** GovTech affirms (1) that the databases support data collection through hardware and software, linking this to the ministry level (L=3). PPD denies (0), also associating it with L=3.

**1\_4B1b:** GovTech affirms (1) that databases support data management, associating this with L=3. PPD denies (0) at the same level.

**1\_4B1c:** GovTech affirms (1) that databases support data dissemination, associating this with L=3. PPD denies (0) at L=3.

**1\_4B2:** Both GovTech and PPD affirm (1) the existence of a policy for archiving databases on computer servers, associating this with L=3.

### Key Contradictions

A key contradiction exists in the perception of database functionalities (1\_4B1a–1\_4B1c). GovTech affirms the availability of hardware and software capabilities, while PPD denies their existence, despite both linking these functionalities to L=3. The agreement on the policy for database archiving (1\_4B2) contrasts with the lack of alignment on operational functionalities, indicating a disconnect in understanding or implementation.

### Recommendations

To address these gaps, it is critical to clarify and document the scope of database functionalities within the education information system. Training and coordination between GovTech and PPD are necessary to ensure a unified understanding of the system’s capabilities. Expanding database operations to dzongkhag (L=2) and school levels (L=1) would decentralize access and improve efficiency. Regular audits should assess hardware and software integration, and policies should be updated to reflect these functionalities comprehensively.

**Table 1.28**

#### *SWOT Analysis for Database*

Strength	Weakness
GovTech recognizes database functionalities for data collection, management, and dissemination at the ministry level.	PPD denies the availability of these functionalities, highlighting a lack of alignment and potential implementation gaps.
Opportunities	Threats
Enhancing communication and training between agencies can ensure shared understanding and effective use of database systems. Expanding database capabilities to dzongkhag and school levels could improve data handling efficiency.	Misalignment between GovTech and PPD may hinder database functionality, leading to inefficiencies in data collection, management, and dissemination.

### 1.6.3 Data Management System

Standard: A system in place manages data collection, processing, and reporting.

Benchmark ⇒ Latent Emerging Established Advanced

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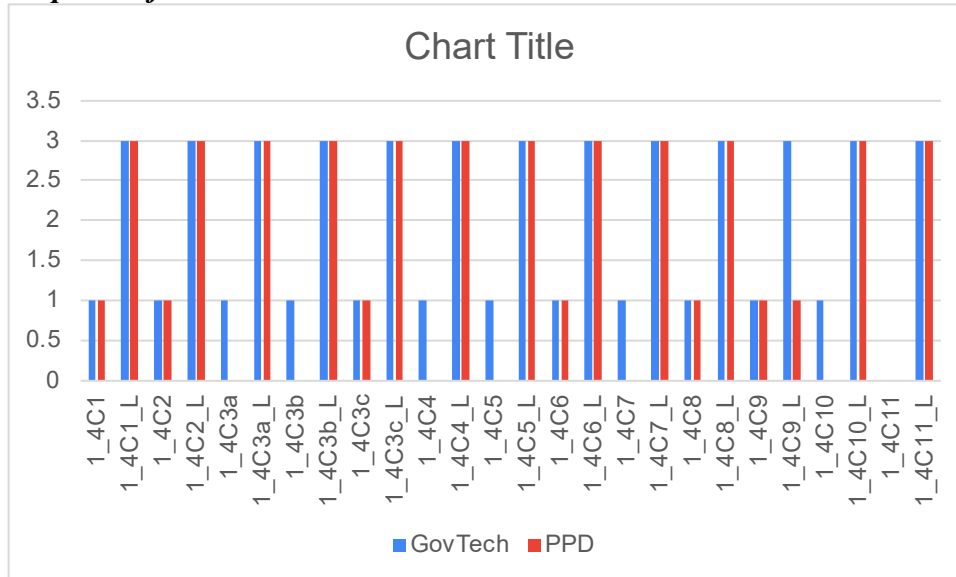
A data management system is in place for the collection, processing, and reporting of data, with strong core capabilities demonstrated by both GovTech and PPD. PPD acknowledges the use of advanced tools such as data warehouses and statistical tools, but GovTech shows gaps in infrastructure and software engagement. The system is functional, but there are operational inconsistencies, especially regarding the use of advanced data management tools at lower levels of governance.

The data management system is rated as Established due to the presence of a functional system for data collection, processing, and reporting, as well as strong capabilities demonstrated at the Ministry level. However, there are gaps in engagement with advanced tools and inconsistencies at lower operational levels, particularly with GovTech's use of relational databases and data warehouses. Strengthening infrastructure and decentralizing support and training would help bridge these gaps and enhance the system's overall effectiveness.

**Table 1.29**  
***Items Measuring Data Management System***

Item	Statement
1_4C1	Does the data management system have the capabilities to process and analyze collected data and report on it systematically (e.g., Banner, PeopleSoft, Oracle, Concordance)? If yes, list name of software in comments.
1_4C2	Does the data management system exist as a layer on the data?
1_4C3	Does data management occur via a combination of database software and hardware including:
1_4C3a	Computer systems?
1_4C3b	Dedicated servers for the EMIS?
1_4C3c	Database management system?
1_4C4	Does the office where the EMIS is housed have computer stations?
1_4C5	Does a computer network exist that is utilized for the EMIS?
1_4C6	Does the EMIS' data management system have a relational database structure?
1_4C7	Does the EMIS include data warehouse architecture?
1_4C8	Does the EMIS include analysis tools for statistical analysis and data management?
1_4C9	Does the EMIS have email systems?
1_4C10	Does the EMIS have a web interface?
1_4C11	Are data management software continually updated and adapted to perform existing and emerging tasks within the EMIS?

**Figure 1.15**  
**Responses for Items in Table 1.29**



### General Trends

The responses indicate a strong presence of data management capabilities, with a majority of items receiving “Yes” (1) responses. Both GovTech and PPD demonstrate alignment in responses, except for a few discrepancies in hardware and specific software functionality (e.g., items 1\_4C3a, 1\_4C3b, 1\_4C4, 1\_4C5, 1\_4C7, and 1\_4C10). The level of operation is predominantly marked as Level 3 (Ministry), reflecting centralized management and oversight.

### Item-by-Item Analysis

- 1\_4C1:** Both GovTech and PPD responded “Yes” (1), confirming that the system processes and analyzes data systematically, using software tools like relational database systems. Level 3 (Ministry) is consistently identified, highlighting centralized functionality.
- 1\_4C2:** The data management system as a layer on the data is affirmed by both groups, with “Yes” (1) responses and Level 3 operations. This indicates uniform understanding and functionality in managing data integration.
- 1\_4C3a:** GovTech reported “Yes” (1), while PPD responded “No” (0) regarding the availability of computer systems for EMIS data management. Both identify Level 3 (Ministry) as the operational level, suggesting potential underutilization or inconsistent infrastructure awareness in PPD.
- 1\_4C3b:** Dedicated servers for EMIS are affirmed by GovTech with “Yes” (1), but PPD reported “No” (0). Both indicate Level 3 as operational, highlighting a contradiction where server availability is acknowledged only by one group.
- 1\_4C3c:** Both agencies confirmed the presence of database management systems with “Yes” (1) responses, aligning at Level 3 (Ministry). This indicates robust and consistent database tools for data management.
- 1\_4C4:** Computer stations for the EMIS office were affirmed by GovTech (“Yes” [1]) but denied by PPD (“No” [0]). Despite this, both groups report Level 3, suggesting possible disparities in resources or perceptions of infrastructure adequacy.

- 1\_4C5:** GovTech responded “Yes” (1) to the existence of a network for the EMIS, while PPD reported “No” (0). Both agencies agree on Level 3, indicating centralized functionality but potential gaps in network availability according to PPD.
- 1\_4C6:** The presence of a relational database structure for the EMIS was affirmed by both groups with “Yes” (1) responses, consistently operating at Level 3. This highlights a strong central database architecture.
- 1\_4C7:** Data warehouse architecture was affirmed by GovTech (“Yes” [1]) but denied by PPD (“No” [0]). Both report Level 3 operations, suggesting potential misalignment in understanding or implementation of data warehousing capabilities.
- 1\_4C8:** Both agencies confirmed the availability of analysis tools for statistical and data management with “Yes” (1) responses, consistently at Level 3. This demonstrates advanced capabilities for data analysis and processing.
- 1\_4C9:** Email systems for the EMIS were affirmed by both GovTech and PPD, but the levels reported differ. While GovTech reports Level 3, PPD identifies Level 1 (School), reflecting localized usage and possible variability in the system’s operational relevance.
- 1\_4C10:** GovTech affirmed the presence of a web interface with “Yes” (1), while PPD responded “No” (0). Both agencies report Level 3, indicating the centralized nature of this feature despite contradictions in availability.
- 1\_4C11:** Neither GovTech nor PPD reported the continuous updating of software, with “No” (0) responses from both. Despite this, Level 3 is identified, suggesting that while central oversight exists, regular updates and adaptations are lacking.

### Key Contradictions

Key contradictions include PPD’s “No” (0) responses for items 1\_4C3b and 1\_4C5, despite identifying Level 3 operations for these items, suggesting either incomplete infrastructure or inconsistent reporting. Similarly, item 1\_4C9 shows School-level activity for email systems according to PPD, while other functionalities remain confined to centralized levels, reflecting uneven distribution of EMIS tools and resources.

### Recommendations

Harmonizing understanding and reporting across GovTech and PPD is essential to address inconsistencies. Conducting joint assessments and infrastructure reviews will help identify and bridge gaps in hardware and network capabilities. Efforts should prioritize decentralization by equipping Dzongkhags and Schools with the necessary resources to utilize EMIS functionalities effectively, ensuring uniformity in data management operations and reporting across all levels.

**Table 1.30**  
**SWOT Analysis for Data Management System**

Strength	Weakness
he system’s centralized control ensures robust data processing and reporting capabilities at the Ministry level.	Limited operational engagement at Dzongkhag and School levels and inconsistencies in hardware and network availability.
Opportunities	Threats
Enhancing decentralization by equipping lower levels with necessary resources and fostering inter-agency collaboration for improved reporting consistency.	Persistent gaps in infrastructure and reporting could undermine the system’s effectiveness and hinder its full institutionalization.

## 1.6.4 Data Dissemination Means

Standard: Data dissemination tools are available and maintained by the agency producing education statistics.

Benchmark ⇒ Latent Emerging Established Advanced



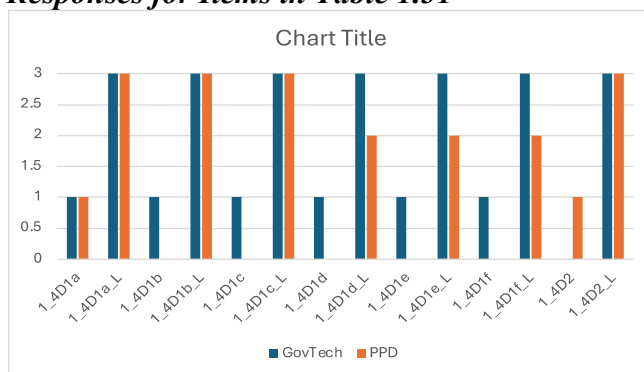
An **Emerging** system indicates progress toward a robust data dissemination framework but requires significant efforts to enhance decentralization, align inter-agency practices, and build capacity to meet the needs of all operational levels effectively.

The data dissemination system is rated as Emerging, reflecting its strong centralized policies but limited decentralization and inconsistent awareness among agencies. Addressing these gaps through targeted capacity-building efforts and improved collaboration can elevate the system to an Established level, ensuring comprehensive and equitable dissemination practices.

**Table 1.31**  
*Items Measuring Data Dissemination Means*

Item	Statement
1_4D1	Are there policies to support the dissemination of data via:
1_4D1a	Internet/websites/mass media?
1_4D1b	Annual educational statistical yearbooks/handbooks?
1_4D1c	Other hard copy materials (e.g., leaflets, pamphlets, student report cards)?
1_4D1d	Other electronic/soft copy materials (e.g., leaflets, pamphlets, PowerPoint presentations, report cards)?
1_4D1e	Electronic databases maintained by the agency producing education statistics?
1_4D1f	Internet/websites/mass media?
1_4D2	Are there policies to support the capacity to disseminate data?

**Figure 1.16**  
*Responses for Items in Table 1.31*



## General Trends

The data reveals a centralized approach to data dissemination, with GovTech consistently reporting “Yes” (1) for policies supporting dissemination across various tools and platforms, while PPD shows gaps, particularly for hard and soft copy materials, databases, and mass media dissemination. Both agencies predominantly identify Level 3 (Ministry) as the operational level, with PPD also reporting Level 2 (Dzongkhag) for some electronic dissemination tools. Item 1\_4D2 reflects a contrasting trend, where GovTech reports “No” (0) for policies supporting dissemination capacity, while PPD affirms their existence.

## Item-by-Item Analysis

- 1\_4D1a:** Both agencies affirm “Yes” (1) for internet and mass media dissemination policies, with Level 3 identified, indicating strong centralized support for web-based dissemination.
- 1\_4D1b:** GovTech confirms policies for annual educational handbooks (“Yes” [1]), while PPD reports “No” (0), yet both identify Level 3 as operational, reflecting a potential gap in handbook distribution oversight by PPD.
- 1\_4D1c:** Similar to 1\_4D1b, GovTech reports “Yes” (1) for policies supporting hard copy materials, while PPD denies this (“No” [0]). Both agree on Level 3, suggesting centralization but incomplete adoption by PPD.
- 1\_4D1d:** Policies for electronic/soft copy materials are affirmed by GovTech (“Yes” [1]) but denied by PPD (“No” [0]). While GovTech identifies Level 3, PPD indicates Level 2, highlighting potential decentralization gaps.
- 1\_4D1e:** GovTech affirms policies for electronic databases (“Yes” [1]), but PPD denies them (“No” [0]). GovTech identifies Level 3, while PPD indicates Level 2, reflecting varying levels of database engagement.
- 1\_4D1f:** Internet/mass media dissemination policies are affirmed by GovTech (“Yes” [1]) but denied by PPD (“No” [0]). Similar to 1\_4D1e, GovTech identifies Level 3, while PPD reports Level 2.
- 1\_4D2:** GovTech denies the existence of policies supporting dissemination capacity (“No” [0]), while PPD affirms them (“Yes” [1]). Both identify Level 3, indicating disagreement on whether capacity policies are formalized at the Ministry level.

## Key Contradictions

Notable contradictions include PPD’s “No” (0) responses for several items despite identifying Level 3 or Level 2 operations, suggesting a lack of alignment in policy awareness or implementation. For instance, GovTech affirms policies for databases and dissemination via mass media (1\_4D1e and 1\_4D1f), while PPD denies their existence yet reports operations at Level 2. Additionally, contrasting responses for 1\_4D2 reveal disagreement on the presence of capacity-building policies, despite both agencies operating at Level 3.

## Recommendations

Improved coordination between GovTech and PPD is essential to resolve discrepancies and ensure consistent implementation of data dissemination policies. Regular joint assessments, policy reviews, and training sessions should be conducted to harmonize understanding and practices. Efforts to decentralize dissemination tools and build capacity at Dzongkhag and School levels will enhance system reach and equity in data access.

**Table 1.32**

***SWOT Analysis for Data Dissemination Means***

<b>Strength</b>	<b>Weakness</b>
Strong centralized systems for internet-based and hard/soft copy dissemination supported by Level 3 policies.	Gaps in adoption and awareness of policies at lower levels; inconsistent reporting between agencies.
<b>Opportunities</b>	<b>Threats</b>
Decentralizing dissemination tools and building capacity at Dzongkhag and School levels to enhance reach and equity.	Misalignment in policy awareness and gaps in policy implementation may undermine the system’s effectiveness.

## 1.7 Budget

General Standard: The system budget is comprehensive, ensuring that the system is sustainable and efficient.

### 1.7.1 Personnel and Professional Development

Standard: The EMIS budget contains a specific budget for EMIS personnel and their professional development.

Benchmark ⇒



The EMIS budget acknowledges the need for personnel and professional development, but the allocation may still be insufficient or poorly decentralized. Some support may exist at the Ministry level, but lower operational levels, such as schools and Dzongkhags, receive limited resources for personnel or training programs. This indicates progress but still highlights significant gaps in implementation.

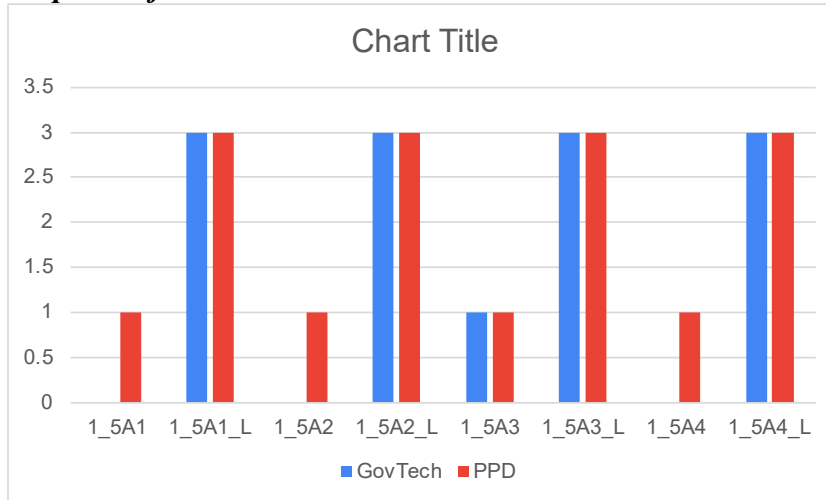
The budget for EMIS personnel and professional development is rated as Emerging, given its centralized policies but inconsistent recognition and documentation between agencies. The presence of budgets for specific activities like yearbooks indicates progress, but significant gaps in understanding and reporting undermine the system’s robustness. Addressing these inconsistencies and exploring decentralization can help elevate the system to an Established level.

**Table 1.33**

***Items Measuring Budget***

Item	Statement
1_5A1	Are there policies to support the dissemination of data via:
1_5A2	Internet/websites/mass media?
1_5A3	Annual educational statistical yearbooks/handbooks?
1_5A4	Other hard copy materials (e.g., leaflets, pamphlets, student report cards)?

**Figure 1.17**  
**Responses for Items in Table 1.33**



### General Trends

The data reveals a split in perspectives between GovTech and PPD on whether specific policies exist to allocate budgets for EMIS personnel and their professional development. While PPD consistently reports “Yes” (1) for all items, GovTech reports “No” (0) for three of the four items (1\_5A1, 1\_5A2, 1\_5A4). Both agencies consistently identify Level 3 (Ministry) as the operational level, indicating centralized management of these policies and practices.

### Item-by-Item Analysis

- 1\_5A1:** GovTech denies (“No” [0]) the existence of a specific budget for EMIS personnel, while PPD affirms its presence (“Yes” [1]). Both agencies agree that this operates at Level 3, highlighting a disagreement on policy existence despite a shared understanding of centralized responsibility.
- 1\_5A2:** Policies for internet and mass media dissemination budgets are similarly denied by GovTech (“No” [0]) but affirmed by PPD (“Yes” [1]). Both identify Level 3, suggesting a centralized but unclear implementation or reporting framework.
- 1\_5A3:** Both agencies affirm (“Yes” [1]) the presence of a budget for annual educational statistical yearbooks or handbooks, with operations at Level 3, reflecting a consistent and centralized policy framework for this item.
- 1\_5A4:** For hard copy materials such as leaflets or report cards, GovTech denies (“No” [0]) the budget’s existence, while PPD affirms it (“Yes” [1]). Again, both agree on Level 3 operations, mirroring the pattern of disagreement on policy existence but consistent identification of operational level.

### Key Contradictions

A notable contradiction is evident between GovTech and PPD responses, where GovTech denies (“No” [0]) the existence of budgets for most items (1\_5A1, 1\_5A2, 1\_5A4), while PPD affirms their presence (“Yes” [1]). This inconsistency highlights a potential misalignment in understanding or communication regarding budget allocations at the Ministry level, despite both agreeing on centralized Level 3 operations.

## Recommendations

A notable contradiction is evident between GovTech and PPD responses, where GovTech denies (“No” [0]) the existence of budgets for most items (1\_5A1, 1\_5A2, 1\_5A4), while PPD affirms their presence (“Yes” [1]). This inconsistency highlights a potential misalignment in understanding or communication regarding budget allocations at the Ministry level, despite both agreeing on centralized Level 3 operations.

**Table 1.34**

### *SWOT Analysis for Measuring Budget*

<b>Strength</b>	<b>Weakness</b>
Centralized management (Level 3) ensures oversight and consistency for existing budgets, such as those for annual statistical yearbooks.	Significant misalignment between key agencies on the presence of specific budgets for critical areas like personnel and hard copy dissemination.
<b>Opportunities</b>	<b>Threats</b>
Joint reviews and better documentation can improve alignment and policy clarity. Decentralization offers an avenue for enhancing local-level engagement in professional development.	Miscommunication and lack of alignment between agencies could lead to inefficient budget utilization or gaps in addressing professional development needs.

## 1.7.2 Maintenance

Standard: The EMIS budget contains a specific budget for system maintenance and recurrent costs.

Benchmark ⇒ Latent Emerging Established Advanced

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The EMIS budget at the Ministry level includes provisions for system maintenance and recurrent costs, ensuring that central maintenance activities are supported. However, there is a significant gap at lower levels (e.g., Schools and Dzongkhags) where maintenance support is lacking. This limits the overall sustainability and responsiveness of the system, and maintenance at lower levels remains reliant on central decisions and allocations.

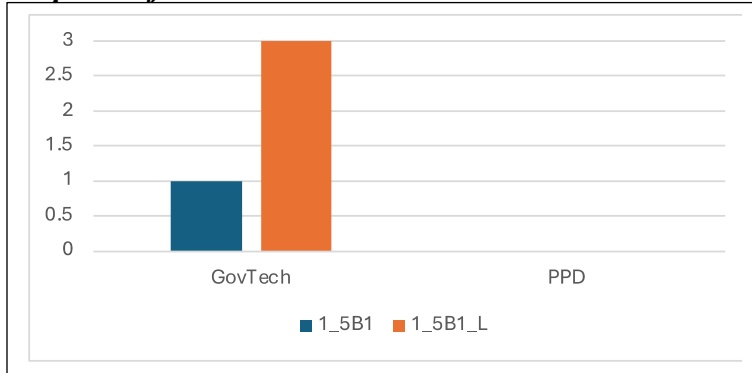
The budget for system maintenance and recurrent costs is rated as Emerging. While GovTech confirms the presence of a budget at the centralized level, the lack of recognition or engagement from PPD indicates limited integration and communication across agencies. Addressing these gaps through improved collaboration, capacity building, and decentralization efforts will help elevate the system to an Established level.

**Table 1.35**

### *Item Measuring Maintenance*

Item	Statement
1_5B1	Does the education information system budget include budgeting for system maintenance and recurrent costs of the system (e.g., license renewal fees)?

**Figure 1.18**  
**Responses for Items in Table 1.35**



### General Trends

The data shows significant divergence between GovTech and PPD regarding the presence of a specific budget for EMIS system maintenance and recurrent costs. GovTech affirms the existence of such a budget with a “Yes” (1) response, identifying Level 3 (Ministry) as the operational level. In contrast, PPD denies the existence of this budget with a “No” (0) response and does not report any operational level, indicating a lack of recognition or implementation of this component in their purview.

### Item-by-Item Analysis

For the main question (1\_5B1), GovTech asserts that the education information system budget includes provisions for maintenance and recurrent costs, such as license renewal fees, and identifies Level 3 (Ministry) as the operational level. On the other hand, PPD denies the existence of such a budget and does not associate it with any level of operation. This discrepancy highlights differing perspectives or levels of awareness between the two agencies regarding system maintenance budgeting at the Ministry level.

### Key Contradictions

Level 3 (Ministry) is the only operational level identified by GovTech for the budget’s existence, reflecting a centralized approach to managing system maintenance and recurrent costs. PPD does not associate any operational level with this item, further emphasizing the lack of decentralization or recognition of this budget component outside GovTech’s domain.

### Recommendations

To resolve this discrepancy, GovTech and PPD should collaboratively review the budget framework for EMIS maintenance and recurrent costs. This process should include clarifying and documenting budget allocations, ensuring all stakeholders are aware of their responsibilities and the system’s financial provisions. Efforts should also focus on building capacity within PPD to recognize and engage with this component, fostering greater alignment and consistency across agencies.

**Table 1.36**  
***SWOT Analysis for Maintenance***

<b>Strength</b>	<b>Weakness</b>
GovTech’s affirmation of a budget for maintenance at the Ministry level provides a foundation for centralized system upkeep.	PPD’s lack of recognition of the budget reflects misalignment and potential gaps in policy awareness or implementation.
<b>Opportunities</b>	<b>Threats</b>
Establishing clear communication and documentation of budget allocations can improve alignment and ensure consistent system maintenance practices.	Discrepancies between agencies could hinder effective utilization of maintenance budgets, leading to system inefficiencies or vulnerabilities.

### 1.7.3 Reporting

Standard: The EMIS budget contains a specific budget for reporting costs.

Benchmark ⇒ Latent Emerging Established Advanced



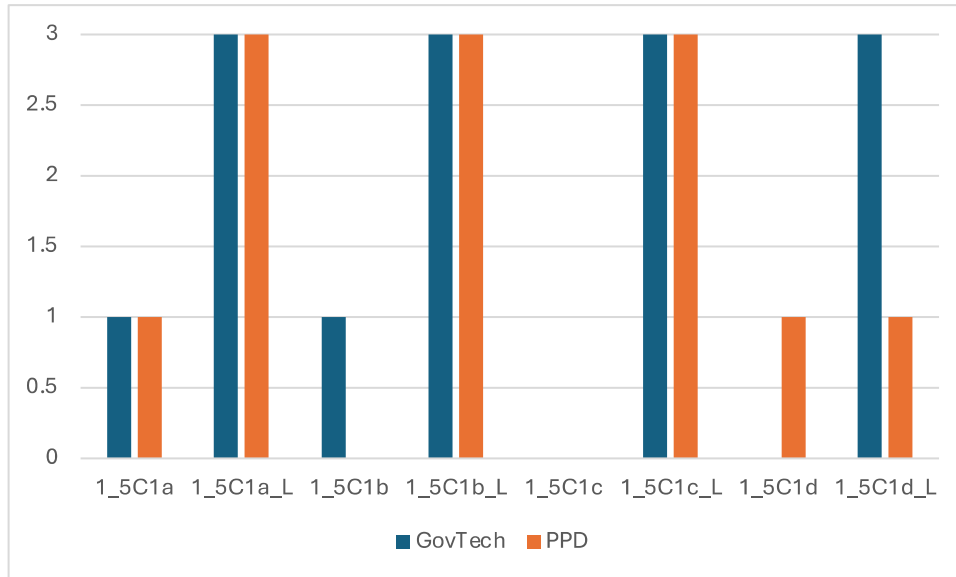
The EMIS budget at the Ministry level includes provisions for reporting activities, with strong support for digital platforms and online dissemination tools. However, there is limited support for reporting activities at decentralized levels, such as Dzongkhags and Schools, which leads to minimal engagement and accessibility challenges. The current budget allocation is insufficient to ensure wide-reaching, inclusive reporting.

The budget for reporting costs is rated as Emerging, reflecting established funding for some activities (e.g., publishing reports) but significant gaps in others, such as website creation and accessible platforms. The centralized nature of operations and inconsistencies between agencies indicate a need for improved alignment and broader decentralization to achieve a more comprehensive and institutionalized reporting framework.

**Table 1.37**  
***Items Measuring Reporting***

Item	Statement
1_5C	Does the education information system budget include financing for reporting including:
1_5C1a	Publishing reports?
1_5C1b	Printing and copying?
1_5C1c	Creating and maintaining websites?
1_5C1d	Creating, maintaining and updating accessible platforms?

**Figure 1.19**  
**Responses for Items in Table 1.37**



### General Trends

The responses indicate varied recognition of budgeting for reporting costs across specific activities. Both GovTech and PPD affirm the presence of a budget for publishing reports (1\_5C1a), with consistent reporting of operations at Level 3 (Ministry). However, discrepancies emerge in other areas: GovTech affirms budgeting for printing and copying (1\_5C1b), while PPD denies it. Both agencies deny budgeting for creating and maintaining websites (1\_5C1c). For creating, maintaining, and updating accessible platforms (1\_5C1d), PPD affirms the presence of a budget, while GovTech denies it. The primary operational level is consistently reported as Level 3, except for PPD, which identifies Level 1 (School) for 1\_5C1d.

### Item-by-Item Analysis

- 1\_5C1a:** Both GovTech and PPD affirm the presence of a budget for publishing reports (“Yes” [1]), with Level 3 (Ministry) identified as the operational level. This indicates strong centralized support for this activity.
- 1\_5C1b:** GovTech reports the existence of a budget for printing and copying (“Yes” [1]), while PPD denies it (“No” [0]). Both identify Level 3 as the operational level, reflecting a discrepancy in understanding or allocation of funds for this purpose.
- 1\_5C1c:** Both agencies deny the presence of a budget for creating and maintaining websites (“No” [0]) but still report Level 3 operations, suggesting that such activities may occur without a dedicated budget.
- 1\_5C1d:** GovTech denies the presence of a budget for creating, maintaining, and updating accessible platforms (“No” [0]), while PPD affirms it (“Yes” [1]). Interestingly, PPD identifies Level 1 (School) as an operational level, reflecting possible localized efforts despite centralized budgeting.

## Key Contradictions

Contradictions include differences between GovTech and PPD on the presence of budgets for printing and copying (1\_5C1b) and accessible platforms (1\_5C1d). While GovTech denies funding for accessible platforms, PPD affirms it, identifying operations at the School level, which contrasts with the typically centralized nature of these activities. Both agencies deny a budget for website creation and maintenance (1\_5C1c) yet report Level 3 operations, indicating potential informal or unfunded efforts.

## Recommendations

To address these gaps, GovTech and PPD should collaborate to standardize budget allocations for reporting costs, ensuring that all activities are adequately funded and recognized. This includes clarifying the roles and responsibilities of each agency in funding and implementing specific reporting activities. Decentralization efforts should be explored to enhance engagement at Dzongkhag and School levels, particularly for platform accessibility and printing needs.

**Table 1.38**

### *SWOT Analysis for Reporting*

Strength	Weakness
Budgeting for publishing reports is consistently affirmed and operational at the Ministry level, ensuring centralized support for key reporting activities.	Discrepancies in recognizing budgets for printing, copying, and accessible platforms reflect gaps in alignment and potential underfunding.
Opportunities	Threats
Improving coordination between agencies can ensure consistency in budgeting and foster decentralization, enabling greater involvement at Dzongkhag and School levels.	Persistent misalignment and lack of funding for website creation and maintenance could hinder the dissemination of reports and accessibility of information.

## 1.7.4 Physical Infrastructure

Standard: The EMIS budget contains a specific budget for physical infrastructure costs.

Benchmark ⇒ Latent Emerging Established Advanced



At the Emerging level, the system reflects initial progress toward comprehensive physical infrastructure support but requires significant enhancements in scope, decentralization, and formalization of all critical budget components to achieve a robust and sustainable state.

The budget for physical infrastructure costs is rated as Emerging, reflecting partial progress with a specific focus on hardware but significant gaps in software budgeting and decentralization. Addressing these weaknesses by broadening budget allocations and empowering lower levels of operation will help elevate the system to an Established state.

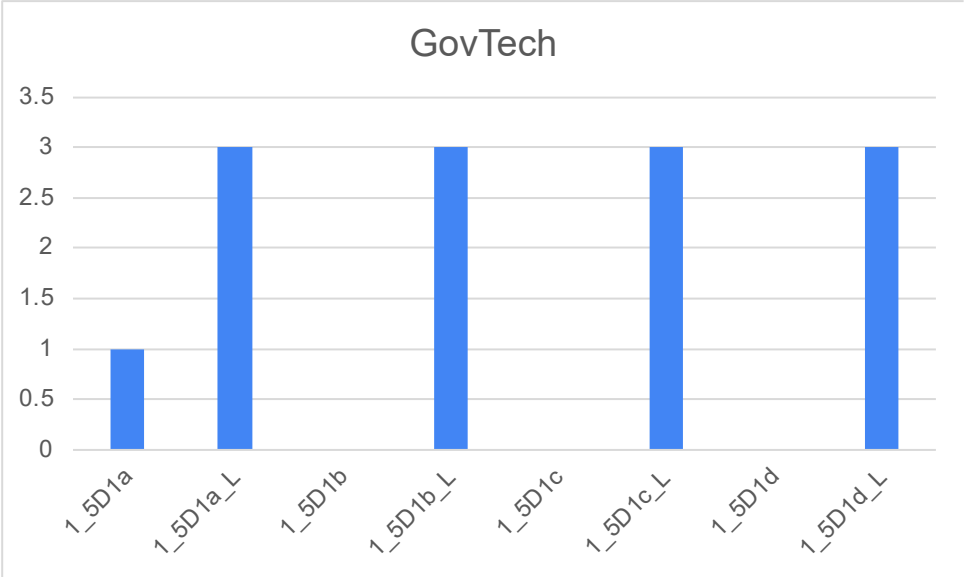
**Table 1.39**

### *Items Measuring Physical Infrastructure*

Item	Statement
1_5D1	Does the budget highlight categories for the following components of the EMIS' physical infrastructure:
1_5D1a	Hardware (e.g., computers, networking, data collection devices)?

1_5D1b	Software (e.g., tools for data collection, analysis software, reporting software)?
1_5D1c	Technical support (e.g., maintenance of databases, hardware and software)?
1_5D1d	Renting space, if applicable?

**Figure 1.20**  
*Responses for Items in Table 1.39*



**General Trends**

The data reveals a partial recognition of budgeting for physical infrastructure costs in the EMIS. GovTech affirms the presence of a budget for hardware (1\_5D1a), identifying Level 3 (Ministry) as the operational level, while denying the existence of a budget for software (1\_5D1b), despite reporting Level 3 operations. This reflects a centralized approach with gaps in specific categories of infrastructure costs.

**Item-by-Item Analysis**

**1\_5D1a:** GovTech affirms the existence of a budget for hardware (e.g., computers, networking, data collection devices) with a “Yes” (1) response. The operational level is identified as Level 3 (Ministry), highlighting a centralized approach to ensuring physical hardware availability for EMIS infrastructure.

**1\_5D1b:** GovTech denies the presence of a budget for software (e.g., tools for data collection, analysis software, reporting software) with a “No” (0) response, despite identifying Level 3 (Ministry) as the operational level. This suggests that software-related expenditures may not be formalized within the budget, even though they may be operationally necessary.

**Key Contradictions**

A key contradiction arises in item 1\_5D1b, where GovTech denies the presence of a software budget but identifies Level 3 operations. This discrepancy may indicate informal funding arrangements or operational dependency on unbudgeted resources. The lack of decentralization

further compounds the issue, as no provisions are reported for Dzongkhags or Schools to manage infrastructure needs locally.

### Recommendations

To address these gaps, the EMIS budget should include explicit allocations for all critical infrastructure categories, including software, alongside existing provisions for hardware. GovTech should ensure that software costs are formalized and communicated clearly across all levels of operation. Decentralization efforts should also be explored to empower Dzongkhags and Schools to manage and sustain their infrastructure needs effectively.

**Table 1.40**  
*SWOT Analysis for Physical Infrastructure*

Strength	Weakness
A dedicated budget for hardware ensures centralized availability of critical physical infrastructure at the Ministry level.	Expanding budget categories to include software and decentralizing infrastructure funding can enhance the system’s reach and efficiency.
Opportunities	Threats
Expanding budget categories to include software and decentralizing infrastructure funding can enhance the system’s reach and efficiency.	Dependency on centralized hardware funding and lack of formalized software budgets may lead to operational inefficiencies and resource gaps.

### 1.7.5 Efficient use of Resources

Standard: Processes and procedures are in place to ensure that resources are used efficiently.

Benchmark ⇒ Latent Emerging Established Advanced



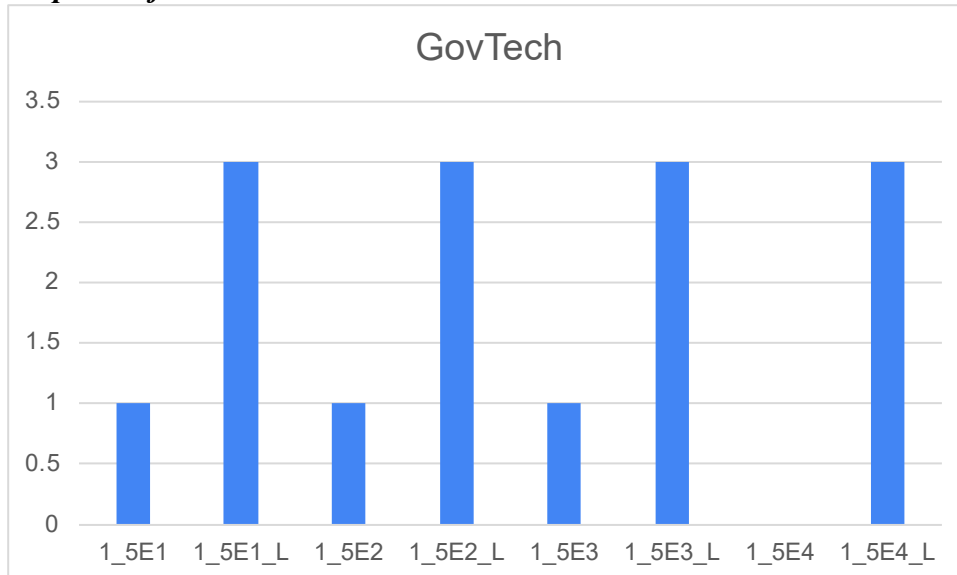
Processes for efficient resource utilization exist at the Ministry level, with strong acknowledgment of audits and subsequent action plans. However, lower operational levels (Schools and Dzongkhags) show limited engagement with these processes, and there is insufficient training or decentralized implementation. While some efforts are in place, they need to be scaled up across all levels to ensure consistent resource utilization practices.

The processes and procedures for efficient use of resources are rated as Emerging, reflecting a structured but incomplete system. While audit processes and feedback mechanisms are in place, the absence of budget reallocation and decentralization limits their effectiveness. Strengthening the connection between audits and actionable financial changes, and involving lower operational levels, will elevate the system to an Established level.

**Table 1.41**  
*Items Measuring Efficient use of Resources*

Item	Statement
1_5E1	Are processes and procedures in place to ensure that resources are used efficiently?
1_5E2	Are audits of the budget performed?
1_5E3	Are there action plans to incorporate feedback from audits to identify areas to amend the budget?
1_5E4	Is the budget reallocated after audits are conducted?

**Figure 1.21**  
**Responses for Items in Table 1.41**



### General Trends

The data indicates that GovTech has processes and procedures in place to ensure resource efficiency and conducts regular budget audits (1\_5E1, 1\_5E2). Action plans are reportedly developed to incorporate feedback from audits (1\_5E3). However, no budget reallocations are performed after audits (1\_5E4), indicating a potential gap in closing the loop on resource efficiency improvements. All activities are reported at Level 3 (Ministry), reflecting centralized management of these processes.

### Item-by-Item Analysis

- 1\_5E1:** GovTech affirms that processes and procedures are in place to ensure resources are used efficiently (“Yes” [1]), with Level 3 (Ministry) identified as the operational level. This suggests that mechanisms for monitoring and managing resource use are centralized.
- 1\_5E2:** Regular budget audits are reported (“Yes” [1]), with Level 3 identified, reflecting a structured approach to evaluating financial management within the Ministry.
- 1\_5E3:** Action plans to incorporate feedback from audits are confirmed (“Yes” [1]) at Level 3. This indicates that audit findings are considered for budgetary adjustments but not necessarily acted upon through reallocation.
- 1\_5E4:** Budget reallocation after audits is not performed (“No” [0]), despite Level 3 operations being reported. This highlights a disconnect between audit processes and actionable outcomes, such as reallocation for improved efficiency.

### Key Contradictions

A contradiction arises between GovTech’s affirmation of action plans to address audit feedback (1\_5E3) and the denial of budget reallocation (1\_5E4). While feedback from audits is acknowledged, the absence of budget reallocation indicates that audit findings may not translate into tangible financial adjustments, undermining the intent of resource efficiency.

## Recommendations

GovTech should prioritize closing the loop between audits, action plans, and budget reallocations to ensure that identified inefficiencies are addressed. This requires formalizing reallocation mechanisms and ensuring that audit recommendations lead to actionable changes. Efforts should also be made to decentralize resource efficiency processes by empowering Dzongkhag and School levels to engage in audits and resource management, fostering broader accountability.

**Table 1.42**  
*SWOT Analysis for Efficient use of Resources*

Strength	Weakness
Structured processes for resource efficiency and regular budget audits at the Ministry level ensure centralized oversight	Lack of budget reallocation after audits undermines the effectiveness of resource efficiency mechanisms and audit processes.
Opportunities	Threats
Implementing formal reallocation procedures and decentralizing resource management to lower levels can enhance efficiency and accountability.	Failure to act on audit findings through reallocation may perpetuate inefficiencies and erode stakeholder confidence in financial management.

## 1.8 Data-Driven Culture

General Standard: Data-driven culture prioritizes data as a fundamental element of operations and decision-making, both inside and outside of the education system.

Benchmark ⇒ Latent Emerging Established Advanced

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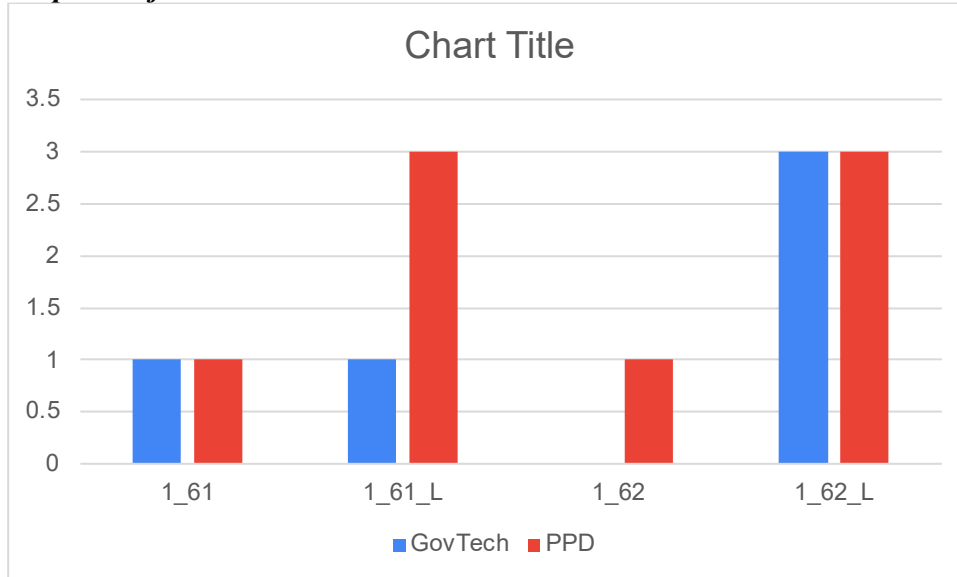
Data collection and its role in decision-making are acknowledged at the Ministry level, with strong support from the government and collaboration with NGOs. However, the culture of data use has not yet fully permeated lower levels such as Schools and Dzongkhags. Efforts are in place to promote data-driven initiatives, but decentralization is limited, and local engagement remains insufficient.

The data-driven culture is rated as Emerging, reflecting progress in promoting data collection and utilization but with significant gaps in alignment, decentralization, and integration of nongovernmental institutions. Addressing these weaknesses by harmonizing agency perspectives, enhancing decentralization, and strengthening partnerships with external stakeholders can elevate the system to an Established state.

**Table 1.43**  
*Items for Data-Driven Culture*

Item	Statement
1_61	Generally, does the government promote the collection and utilization of data within and beyond the education system (e.g., national census, funding to research institutes that use data, population statistics, etc.)? If yes, list examples in comments section.
1_62	Do nongovernmental institutions exist that support the collection and utilization of data? If yes, list names of organizations in comments section.

**Figure 1.22**  
**Responses for Items in Table 1.43**



### General Trends

The data shows that both GovTech and PPD affirm the government’s promotion of data collection and utilization within and beyond the education system (1\_61), though they differ in identifying the level of operation. For nongovernmental institutions supporting data collection and utilization (1\_62), PPD affirms their existence, while GovTech denies it. Operational levels are predominantly identified as Level 3 (Ministry), except for GovTech associating the government’s promotion of data (1\_61) with Level 1 (School).

### Item-by-Item Analysis

**1\_61:** Both GovTech and PPD agree (“Yes” [1]) that the government promotes data collection and utilization. However, GovTech identifies Level 1 (School) as the operational level, while PPD identifies Level 3 (Ministry), suggesting differences in perceived reach or implementation.

**1\_62:** GovTech denies (“No” [0]) the existence of nongovernmental institutions supporting data collection, while PPD affirms (“Yes” [1]) their presence, associating them with Level 3 (Ministry). This discrepancy highlights a potential lack of awareness or misalignment between agencies.

### Key Contradictions

Contradictions arise in the operational levels identified for 1\_61, where GovTech associates data promotion with schools (Level 1) and PPD with the Ministry (Level 3). Additionally, GovTech denies the existence of nongovernmental institutions (1\_62) despite PPD affirming their role at Level 3, reflecting discrepancies in the awareness or recognition of external data stakeholders.

### Recommendations

Efforts should focus on harmonizing understanding between GovTech and PPD regarding the operational levels and roles of both governmental and nongovernmental entities in promoting data utilization. Conducting joint reviews of data policies and involving Dzongkhag and School levels

in data-driven initiatives can enhance alignment and decentralization. A centralized database of active nongovernmental institutions supporting data efforts should be created to improve visibility and coordination.

**Table 1.44**  
***SWOT Analysis for Data-Driven Culture***

<b>Strength</b>	<b>Weakness</b>
Government initiatives promoting data collection and utilization are affirmed, showing a foundational data-driven culture.	Lack of alignment between agencies on the operational levels of government promotion and recognition of nongovernmental support limits consistency.
<b>Opportunities</b>	<b>Threats</b>
Expanding awareness of nongovernmental organizations and involving decentralized levels in data-related activities can strengthen the data-driven culture.	Misalignment and limited decentralization could undermine efforts to embed data utilization in decision-making across all levels.

## 1.9 Overall Benchmark

The overall benchmark for Policy Area 1: Enabling Environment is classified as *Emerging*, determined by averaging the benchmarks of its major factors. According to the scale, a system at the *Emerging* level contains basic components of a comprehensive enabling environment, such as a legal framework, organizational structure and institutional processes, human resources, infrastructure capacity, budget, and a data-driven culture. This indicates that while the foundational elements are in place, the system has not yet progressed to the *Established* level, where most components are present, or the *Advanced* level, where all crucial components are fully functional. To advance beyond the *Emerging* level, it is recommended to review the components and their benchmarks presented in this chapter.

## 1.10 Conclusion

The enabling environment is a critical foundation for establishing and operating an effective and dynamic framework to support decision-making and system functionality. This chapter examined six key factors that collectively reflect the health and functionality of the system: Legal Framework, Organizational Structure and Institutionalized Processes, Human Resources, Infrastructural Capacity, Budget, and Data-Driven Culture. Each factor was analyzed through a comprehensive approach, including a review of general trends, item-by-item evaluations, and the formulation of actionable recommendations.

To provide a structured assessment, each factor was benchmarked using a four-level performance scale: Latent, Emerging, Established, and Advanced. The “Advanced” level represents the highest standard of functionality, where all necessary components are fully operational and aligned with system goals. This benchmarking offers stakeholders a clear framework for evaluating current practices and identifying areas for improvement.

The findings emphasize the importance of a robust enabling environment where legal frameworks are well-defined, institutionalized processes are operational, human resources are adequately skilled, infrastructural capacity is sufficient, budgets are appropriately allocated, and a culture of

data-driven decision-making is fostered. These interconnected elements collectively ensure that the system is equipped to support efficient and informed decision-making.

Moving forward, stakeholders are encouraged to utilize the benchmarks and insights provided in this chapter to prioritize interventions aimed at strengthening the enabling environment. By addressing gaps and leveraging strengths, the system can better support sustainable improvements and long-term success. Ultimately, a well-developed enabling environment will enhance the system's capacity to achieve its strategic objectives and drive meaningful progress across all levels of operation.

## Bibliography

- Abdul-Hamid, H. (2017). *Data for learning: Building a smart education data system*. World Bank Group.  
<https://documents1.worldbank.org/curated/en/444461505806849250/pdf/119805-PUB-PUBLIC-DOCDATE-10-6-17.pdf>
- BCSEA. (2021). 2021 examination highlights. <https://www.bcsea.bt/>
- Beginkulov, E., & Darr, D. (2023). Scaling strategies and mechanisms in small and medium enterprises in the agri-food sector: A systemic literature review. *Front. Sustain. Food Syst.* 7. <https://doi.org/10.3389/fsufs.2023.1169948>
- Doval, E. (2019). Risk management process in projects. *Review of General Management*, 30(2), 97-113. <http://www.managementgeneral.ro/pdf/2-2019-6.pdf>
- Druk Gyalpo's Institutes (n.d). Motherboard. <https://rigpa.pangbisa.com/>
- Education Monitoring Division. (2022). *School performance management system: Operational guidelines*. [https://www.dungtsecs.edu.bt/SPMS\\_OG\\_updated\\_08.03.22.pdf](https://www.dungtsecs.edu.bt/SPMS_OG_updated_08.03.22.pdf)
- Fafard, P., & Hoffman, S.J. (2020). Rethinking knowledge translation for public health policy. *Evidence & Policy*, 16(1), 165-175.  
<https://bristoluniversitypressdigital.com/view/journals/evp/16/1/article-p165.xml>
- Fiddicke, U., Pack, L.K., Tolonen, H., Sepai, O., Lopez, M.E., Castano, A., Schoeters, G., Gehring-Kolossa, M. (2021). A phased approach for preparation and organization of human biomonitoring studies. *International Journal of Hygiene and Environmental Health*, 232().<https://www.sciencedirect.com/science/article/pii/S1438463920306301?via%3Dihub>
- Fullan, M. (2016). *The new meaning of educational change* (5<sup>th</sup> ed.). Routledge
- Gargani, J., & McLean, R. (2017). Scaling Science. *Stanford Social Innovation Review*, 15(4), 34–39. <https://doi.org/10.48558/CX49-R467>
- Global Partnership for Education. (2019). *Meeting the data challenge in education*.  
<https://www.globalpartnership.org/node/document/download?file=document/file/2019-07-15-Meeting-the-data-challenge-in-education.pdf>
- Hall, G.E. & Hord, M.S. (2020). *Implementing change: Patterns, principles, and potholes* (5<sup>th</sup> ed.). Pearson Education, Inc.
- IRDC. (n.d.). Guide to integrating gender in your project. <https://idrc-crdi.ca/en/kix-call-proposals-knowledge-and-innovation-strengthened-education-data-systems-and-data-use>
- Kositsky, M.R. (2023). Education statistics: Facts about American schools.  
<https://www.edweek.org/leadership/education-statistics-facts-about-american-schools/2019/01>

- Lavis, J.N., Robertson, D., Woodside, J. M., McLeod, C.B., Ableson, J. (2003). How can research organizations more effectively transfer research knowledge to decision makers? *The Milbank Quarterly*, 81(2), 221-248. <https://pubmed.ncbi.nlm.nih.gov/12841049/>
- Management System International. (2016). *Scaling up—from vision to large-scale change: A management framework for practitioners* (3<sup>rd</sup> ed.). Management Systems International.
- Martin, P.P., Apgar, M., & Hernandez, K. (2019). *Adaptive management in SDC: Challenges and opportunities*. Swiss Agency for Development and Cooperation SDC.
- McLean, R. & Gargani, J. (2019). *Scaling impact: Innovation for the public good*. Routledge.
- Ministry of Education and Skills Development. (n.d). EMIS portal. <https://portal.education.gov.bt/>
- Ministry of Education and Skills Development. (n.d). Royal Kasho on Education Reform. <http://www.education.gov.bt/?p=8297>
- Ministry of Education. (2014). Bhutan education blueprint 2014-2024: Rethinking education. <http://www.education.gov.bt/wp-content/downloads/publications/publication/Bhutan-Education-Blueprint-2014-2024.pdf>
- Ministry of Education. (2019). iShering-2: Education ICT master plan 2019-2023. <http://www.education.gov.bt/wp-content/uploads/2021/09/iSherig-2-Education-ICT-MNasterplan-2019-2023.pdf>
- Ministry of Education. (2020). Bhutan professional standards for teachers. <http://www.education.gov.bt/wp-content/uploads/2021/09/BPST.pdf>
- National Forum on Education Statistics. (2021). *Forum Guide to Strategies for Education Data Collection and Reporting* (NFES 2021013). U.S. Department of Education. Washington, DC: National Center for Education Statistics. <https://files.eric.ed.gov/fulltext/ED611949.pdf>
- National Statistics Bureau of Bhutan. (2018). 2017 population and housing census of Bhutan. <https://www.nsb.gov.bt/publications/census-report/>
- National Statistics Bureau. (2020). 12 five year plan: 1 November 2018- 31 October 2023. <https://www.nsb.gov.bt/12th-five-year-plan>
- Office of the Prime Minister and Cabinet. (2023). Flagship Programs. [https://www.pmo.gov.bt/?stm\\_service=flagship-programs#1591395806422-2335c4b3-028a](https://www.pmo.gov.bt/?stm_service=flagship-programs#1591395806422-2335c4b3-028a)
- Palden, T. (2020, 18 December). His Majesty grants kashos to reform civil service and education system. <https://kuenselonline.com/his-majesty-grants-kashos-to-reform-civil-service-and-education-system/>
- Panel on Research Ethics. (2022). Tri-council policy statement: Ethical conduct for research involving humans-TCTS 2 (2022). [https://ethics.gc.ca/eng/policy-politique\\_tcps2-eptc2\\_2018.html](https://ethics.gc.ca/eng/policy-politique_tcps2-eptc2_2018.html)
- Policy and Planning Division. (2022). *Annual education statistics* (34<sup>th</sup> ed.). <http://www.education.gov.bt/wp-content/uploads/2023/04/AES-2022-revised-1.pdf>
- Poudel, K.Y. (2022, December 22). EMIS problems delay school results across Bhutan. *Kuensel*. <https://kuenselonline.com/emis-problems-delay-school-results-across-bhutan/>
- Renard, Y. (2004). *Guidelines for stakeholder identification and analysis: A manual for Caribbean natural resource managers and planners*. Caribbean Natural Resources Institute. <https://web.archive.org/web/20131006213155/http://www.canari.org/Guidelines5.pdf>

- Rogers, P. (2014). Theory of change: Methodological briefs, impact evaluation No. 2. UNICEF. [https://www.unicef-irc.org/publications/pdf/brief\\_2\\_theoryofchange\\_eng.pdf](https://www.unicef-irc.org/publications/pdf/brief_2_theoryofchange_eng.pdf)
- Roy, A., & Marie, A. (2005). *Knowledge translation: Basic theories, approaches, and applications*. <https://idl-bnc-idrc.dspacedirect.org/handle/10625/3193>
- Social Sciences and Humanities Research Council. (2019). *Guidelines for effective knowledge mobilization*. [https://www.torontomu.ca/content/dam/research/documents/2023-04-06\\_Intro-to-Knowledge-Mobilization-Strategies-and-Tools.pdf](https://www.torontomu.ca/content/dam/research/documents/2023-04-06_Intro-to-Knowledge-Mobilization-Strategies-and-Tools.pdf)
- UK Research and Innovation. (2018). *Promoting fair and equitable research partnerships to respond to global challenges*. [https://rethinkingresearchpartnerships.files.wordpress.com/2018/10/fair-and-equitable-partnerships\\_research-report-public.pdf](https://rethinkingresearchpartnerships.files.wordpress.com/2018/10/fair-and-equitable-partnerships_research-report-public.pdf)
- UNESCO. (2018). Re-orienting education management information systems (EMIS) towards inclusive and equitable quality education and lifelong learning. [https://www.openemis.org/wp-content/uploads/2018/05/UNESCO\\_Re-orienting\\_Education\\_Management\\_Information\\_Systems\\_EMIS\\_towards\\_inclusive\\_and\\_equitable\\_quality\\_education\\_and\\_lifelong\\_learning\\_2018\\_en.pdf](https://www.openemis.org/wp-content/uploads/2018/05/UNESCO_Re-orienting_Education_Management_Information_Systems_EMIS_towards_inclusive_and_equitable_quality_education_and_lifelong_learning_2018_en.pdf)
- UNESCO. (2019). Education management information system. <https://emis.uis.unesco.org/>
- UNESCO. (2021). Modernizing education management with EMIS: Building back stronger from the COVID-19 pandemic. [https://unesdoc.unesco.org/ark:/48223/pf0000382825\\_eng](https://unesdoc.unesco.org/ark:/48223/pf0000382825_eng)
- UNGEI. (2010). *Equity and inclusion in education: A guide to support education sector plan preparation, revision, and appraisal*. <https://www.globalpartnership.org/sites/default/files/2010-04-GPE-Equity-and-Inclusion-Guide.pdf>
- UNICEF. (2019). *Gender toolkit: Integrating gender in programming*. UNICEF Regional Office for Europe and Central Asia. <https://www.unicef.org/eca/media/15101/file>
- United Nations. (n.d.). Goals 4: Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all. <https://sdgs.un.org/goals/goal4>
- United States Census. (2021). Quick facts: United States. <https://www.census.gov/quickfacts/fact/table/US/HSD410221>
- Wiilims, B.K., Szaro, R.C., & Shapiro, D.C. (2009). *Adaptive management: The U.S department of the interior technical guide*. Adaptive Management Working Group, U.S. Department of the Interior. Washington, DC. <https://www.doi.gov/sites/doi.gov/files/uploads/TechGuide-WebOptimized-2.pdf>
- World Bank Group. (2011). *Improving information systems for planning and policy dialogue: The SABER EMIS assessment tool*. [http://wbgfiles.worldbank.org/documents/hdn/ed/saber/supporting\\_doc/background/ems/saberemis.pdf](http://wbgfiles.worldbank.org/documents/hdn/ed/saber/supporting_doc/background/ems/saberemis.pdf)
- World Bank Group. (2015). *World Bank group gender strategy (FY16-23): Gender equality, poverty reduction and inclusive growth*. <http://hdl.handle.net/10986/23425>
- World Bank Group. *Improving information systems for planning and policy dialogue: The SABER EMIS assessment tool*. [http://wbgfiles.worldbank.org/documents/hdn/ed/saber/supporting\\_doc/background/ems/saberemis.pdf](http://wbgfiles.worldbank.org/documents/hdn/ed/saber/supporting_doc/background/ems/saberemis.pdf)
- WSDOT. (2018). *Project risk management guide*. <https://www.wsdot.wa.gov/publications/fulltext/cevp/projectriskmanagement.pdf>

Wyk, C. van & Crouch, L. (2020). *Efficiency and effectiveness in choosing and using an EMIS: Guidelines for data management and functionality in EMIS*. UNESCO Institute for Statistics. <https://emis.uis.unesco.org/wp-content/uploads/sites/5/2020/09/EMIS-Buyers-Guide-EN-fin-WEB.pdf>

# Annexure 1 Settings for EMIS Situational Analysis Study

## 1.1 Introduction

This annexure provides a comprehensive overview of the processes undertaken in conducting the situational study of the Education Management Information System (EMIS) and the Motherboard platform in Bhutan. It establishes the context for the study and details the foundational aspects and methodologies that guided the research.

The annexure begins by introducing the MIEMIS project, outlining its problem statement, research questions, and specific objectives, which serve as the basis for the situational study. It then describes the objectives of the situational study and reviews the relevant literature that informs the research. The theoretical framework and benchmark scale used for evaluation are introduced, along with the sampling process for participant selection. The chapter also discusses using the SABER-EMIS tool, its administration, data collection via Google Forms, and subsequent analysis using SPSS. Additionally, the four policy areas central to the study—Enabling Environment, System Soundness, Quality Data, and Utilization for Decision-Making—are presented as the framework for evaluation. The chapter concludes with an outline of the report’s structure, providing a roadmap for navigating the findings and analyses in the subsequent chapters.

## 1.2 MIEMIS Problem Statement

Bhutan's modern education system has made significant progress in student enrollment and school infrastructure, but challenges persist in the quality of learning outcomes (BCSEA, 2021; Policy and Planning Division, 2022). To address these challenges, Bhutan uses education data to monitor student performance and inform evidence-based policies and interventions. It collects and manages education data using an Education Management and Information System (EMIS).

EMIS is expected to serve as a comprehensive system that collects, manages, and analyzes education-related data, enabling informed decision-making and monitoring of the education system (World Bank Group, 2011; Abdul-Hamid, 2017; Wyk & Crouch, 2020). Bhutan endeavors to derive similar benefits (Policy and Planning Division, 2022). However, challenges persist in the EMIS of Bhutan (Ministry of Education, n.d.). For instance, Poudel (2022) reported in Kuensel that EMIS problems delay school results across Bhutan.

Bhutan also has a homegrown data system called Motherboard, which allows for formative assessments, qualitative feedback, narrative reports, and more than just quantitative data. DGI uses the Bhutan Baccalaureate in 23 schools, with plans to expand to all schools in the future (Prime Minister’s Office, 2021), showing the system's potential for nationwide implementation, indicating that EMIS and Motherboard should interoperate seamlessly in Bhutan’s education system, pointing the need for further research. However, Motherboard has not been evaluated for its strengths and weaknesses; it was a decade since the EMIS was assessed. This situational analysis study explores the usefulness and adequacy of the features of Motherboard and EMIS to understand how much they leverage teaching and learning through quality data. The situational

analysis study also examines how EMIS and Motherboard address gender equality, equity, and inclusion (GEI) issues and their combined potential to address GEI concerns.

EMIS and Motherboard have different data focuses. EMIS data is primarily quantitative, while Motherboard data is mainly qualitative. While their combined data can provide more fine-grained information to address equity and inclusion concerns, these two systems have yet to be integrated. However, this situational analysis study explores the overall feasibility of the integration, including a small-scale pilot integration of the two in 22 Bhutan Baccalaureate schools where Motherboard is used.

Bhutan's policy priorities and enabling environment support the development of EMIS (Office of the Prime Minister and Cabinet, 2023; Ministry of Education, 2014). The ICT infrastructure in Bhutan creates a favorable environment for EMIS implementation (National Statistics Bureau, 2018; Policy and Planning Division, 2022). Furthermore, the Bhutan Professional Standards for Teachers mandate using ICT resources in teaching (Ministry of Education, 2019). These factors provide a strong foundation for advancing EMIS and the Motherboard in Bhutan. Hence, this situational analysis study explores areas enhancing the use of the EMIS and the Motherboard to address the challenges Bhutan faces in leveraging data-driven decision-making and policy interventions.

### **1.3 MIEMIS Objectives**

The overarching objective of MIEMIS is to advance data systems and data utilization in Bhutan's education system. This objective will be achieved through the following specific objectives:

- (a) Generate evidence-based insights on scaling EMIS and the Motherboard.

The project aims to conduct thorough research and experimentation to identify and implement the merged version of EMIS and Motherboard, effectively addressing challenges related to data systems and data utilization in education. Through the collection and analysis of data on the impact of these systems, the project will generate evidence-based interventions to tackle the challenges and establish strategies for scaling the systems for broader implementation.

- (b) Enhance stakeholder capacity building for knowledge utilization and EMIS and Motherboard.

The project will prioritize building the capacities of key stakeholders, including educators, policymakers, administrators, researchers, and parents/community. Through targeted training, workshops, and collaborative learning opportunities, stakeholders will be equipped with the necessary skills and knowledge to effectively understand, adopt, and utilize the EMIS and the Motherboard in data systems and data use within education systems. The project will also provide research inputs to the technical team to develop a user-friendly dashboard for EMIS and Motherboard, offering intuitive visualizations and customization options.

- (c) Mobilize knowledge and evidence generated on EMIS and Motherboard for informed policy and practice.

The project will actively disseminate the evidence and insights generated from the research and experimentation. This will be achieved by developing comprehensive reports, policy briefs, and interactive platforms such as conferences and webinars. By engaging policymakers, practitioners,

and researchers, the project will facilitate a knowledge-sharing and dialogue process, enabling the evidence to inform and guide improvements in policies and practices related to EMIS and Motherboard and data use in education. The project will investigate the viability of creating a dedicated website where schools can seamlessly exchange educational data, encompassing student performance and curriculum information. Additionally, leverage social media platforms to amplify data sharing, foster stakeholder engagement, and increase visibility.

- (d) Enhance stakeholder engagement and foster partnerships and collaboration for sustainable impact.

The project will actively seek partnerships and collaborations with relevant stakeholders, including educational institutions, government agencies, non-profit organizations, and technology providers. By fostering a collaborative ecosystem, the project aims to create a sustainable impact by leveraging collective expertise, resources, and networks to scale up the implementation of EMIS and Motherboard and ensure their long-term effectiveness. Also, the project will explore spaces to include educational data use with EMIS and Motherboard as a unit component in the assessment and research modules of the program offered at the colleges of education in Bhutan to develop real-time data literacy and use by pre-service and in-service student teachers.

- (e) Strengthen the capacity of EMIS to address Gender Equality and Inclusion issues effectively.

The project will endeavor to strengthen EMIS, improving its capacity to address Gender Equality and Inclusion (GEI) by enhancing its ability to collect, analyze, and utilize data. This enhancement will be designed to actively promote GEI principles and ensure the inclusion of diverse perspectives within the education sector.

#### **1.4 MIEMIS Research Questions**

- (a) How can EMIS and Motherboard be effectively adapted, scaled, and implemented to promote gender equality, equity, and inclusion in education?
- (b) What are the enabling factors, barriers, and incentives influencing the scaling of EMIS V3.0 and the Motherboard in data systems and data used for education?
- (c) How can EMIS, Motherboard, artificial intelligence, and social-media platforms effectively enhance data utilization and decision-making processes in education?
- (d) How can data use be expanded and diversified to promote public accountability while improving educational outcomes?
- (e) How can EMIS and Motherboard be interoperable and tested to ensure their suitability and impact in the Bhutanese school education system?
- (f) How can EMIS be enhanced to incorporate gender-responsive features and practices, ensuring inclusivity and addressing gender-specific needs within the education sector?

The MIEMIS project has six phases, which are to achieve its objectives and address questions. This study focuses on Phase 1, which involves conducting a situational analysis of EMIS and Motherboard.

#### **1.5 Objective of Situational Analysis Study of EMIS and Motherboard**

Phase 1 (WP5) of the MIEMIS project focuses on conducting a situational analysis study of Bhutan's existing Education Management Information System (EMIS) and the Motherboard

platform. This phase aims to provide a comprehensive assessment of EMIS and Motherboard components, collect and analyze baseline data, and identify data quality and integrity issues. It also seeks to evaluate current data management practices and assess how gender-disaggregated data is integrated into decision-making processes using EMIS and Motherboard. Additionally, the analysis aims to identify gaps and challenges within both systems. These efforts are expected to generate critical insights into the current status and functionality of the systems, serving as a foundation for subsequent phases of the project.

## **1.6 Literature Review**

This study is grounded in a comprehensive review of relevant literature, providing a strong foundation for understanding the intersection of education data, accountability, policy decisions, and the implementation of Education Management Information Systems (EMIS). The review explores the benefits and challenges of EMIS, scaling approaches, stakeholder engagement, data-use culture, gender equality, and adaptive management. It also examines the relationship between change theory and developing a culture that values data-informed decision-making.

Bhutan's education system has made notable progress since the 1950s, achieving a net enrollment rate of 93.3% for primary education, with one school per approximately 269 households (Policy and Planning Division, 2022; National Statistics Bureau, 2018). In comparison, the United States reports one school per 962 households (Kositsky, 2023; United States Census, 2021). However, despite these advancements, Bhutan faces challenges in ensuring equitable and high-quality education. For instance, its high school graduation rate is 82.0% (BCSEA, 2021), lower than the United States' 88.9% (United States Census, 2021). Addressing these challenges requires leveraging education data to inform decisions, improve outcomes, and establish robust accountability mechanisms, as seen in global practices (Global Partnership for Education, 2019; UNESCO, 2019; National Forum on Educational Statistics, 2021).

Bhutan has made significant strides in creating a supportive legal and institutional environment for EMIS through initiatives such as "Towards Digitized Bhutan" (National Statistics Bureau, 2020), "Leverage ICT for Learning" (Ministry of Education, 2014), and the "iSherig" plans (Ministry of Education, 2019). These initiatives emphasize the integration of ICT into education and establishing a conducive environment for EMIS and the Motherboard system. Additionally, widespread smartphone ownership, improved internet connectivity, and increased computer availability in schools (National Statistics Bureau, 2018; Policy and Planning Division, 2022) create favorable conditions for EMIS implementation. The Bhutan Professional Standards for Teachers mandate using ICT as a teaching resource, further strengthening the commitment to leveraging technology for better educational outcomes and a robust EMIS ecosystem (Ministry of Education, 2019).

Bhutan's journey toward implementing EMIS began in the early 2000s and culminated in launching its first operational version in 2010 with the support of international partners (Ministry of Education, n.d.). Globally, EMIS is expected to function as a comprehensive system for collecting, managing, and analyzing education-related data (Abdul-Hamid, 2017; Global Partnership for Education, 2019; UNICEF, 2019; World Bank Group, 2011; Wyk & Crouch, 2020). Bhutan's EMIS is envisioned to perform similar functions, enabling data-driven decision-making to improve education outcomes (Ministry of Education, n.d.).

Key findings from the literature review are summarized in Table 1.1, which provides insights into the four policy areas: Enabling Environment, System Soundness, Quality Data, and Utilization in Decision-Making. The table is a practical resource for EMIS stakeholders, offering reference points grounded in benchmarks discussed in subsequent chapters. These insights can assist stakeholders in assessing and improving EMIS-related interventions by prioritizing areas for improvement, aligning strategies with global standards, and ensuring the effectiveness and sustainability of their actions. Additionally, Table 1.1 (see Annex 4) fosters collaboration by providing a shared understanding of critical indicators, promoting consistency in policy formulation and implementation. While not an exhaustive review of EMIS literature, the table is curated to provide foundational insights and encourage further topic exploration.

## **1.7 EMIS and Motherboard Situational Analysis Study**

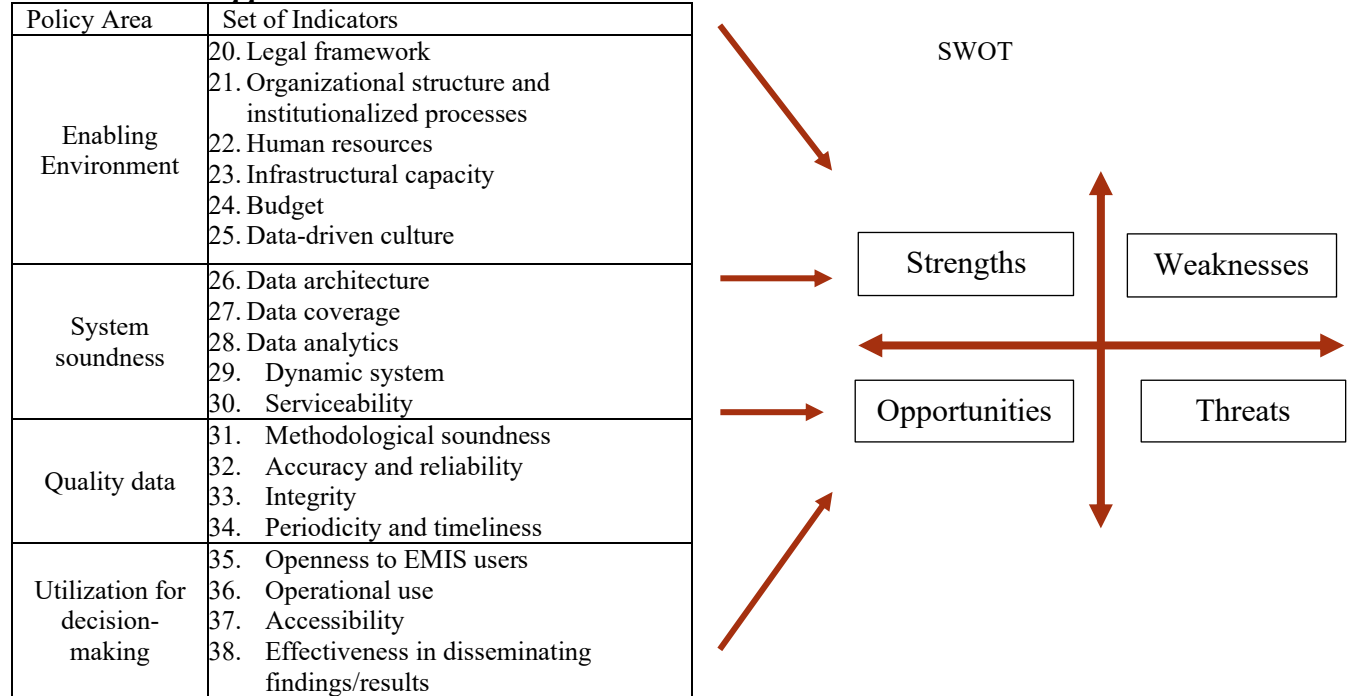
Phase 1 (WP5) of the MIEMIS project is focused on a situational analysis study of Bhutan's existing Education Management Information System (EMIS) and the Motherboard platform. Under Phase 1, a situational analysis study was carried out. The study employed the SABER-EMIS approach (see Abdul-Hamid et al., 2014) and accompanying data collection tools to comprehensively assess Bhutan's current EMIS. Concurrently, a comparative analysis was conducted to evaluate the functional capabilities of EMIS and Motherboard and determine the feasibility of seamlessly integrating these two systems. The power-influence matrix method was utilized to identify key stakeholders for participation in the baseline study.

### **1.7.1 Theoretical Framework for Situational Analysis Study for Benchmarking Bhutan's EMIS and Gruk Gyalpo's Institute's Motherboard**

This study adopted the SABER-EMIS approach to assess the EMIS within Bhutan's school education system. As articulated by Abdul-Hamid et al. (2014), the SABER-EMIS framework provides a comprehensive assessment of education information systems across four key policy areas: (1) Enabling Environment (Assessment of intended policies about a sustainable infrastructure and human resources that can handle data collection, management, and access), (2) System Soundness (Assessment of the degree to which the processes and structure support the components of a comprehensive information management system), (3) Quality Data (Assessment of the degree to which an EMIS system accurately collects, securely saves, and produces high-quality, timely information), and (4) Utilization for Decision-Making (Assessment of the reality of system implementation and utilization of EMIS information in decision-making).

This framework facilitates informed policy discussions on education statistics and indicators while enabling countries to effectively monitor progress across all levels of the education system – from inputs and processes to desired outcomes. Each of these four policy areas encompasses a specific set of indicators. The assessment data about these four policy areas, aggregated at the indicator level, were subjected to STWO (Strengths, Weaknesses, Opportunities, and Threats) analysis to gain specific insights (Humphrey, 2005). This SWOT analysis empowers EMIS assessors to identify areas for improvement and develop targeted action plans based on the identified indicators. Figure 1 provides a visual representation of the SABER-EMIS approach. The SABER-EMI approach is based on the International Organization for Standardization's series ISO 9000, the Education Data Quality Assessment Framework (Ed-DQAF), and Utilization-Focused Evaluation (UFE) (Abdul-Hamid et al., 2014), indicating its validity and reliability.

**Figure 1**  
**SABER-EMIS Approach\***



\*For more detailed information about the policy areas and their associated factors, refer to Abdul-Hamid (2014).

### 1.7.2 Benchmark Scale

The benchmark levels for each indicator within a policy area are categorized into four levels: latent, emerging, established, and advanced. The advanced level represents the expected standard for each indicator and serves as the baseline for defining the other three levels. To establish the advanced level, researchers conducted a comprehensive evaluation based on general trends, item-by-item analysis, key contradictions, and recommendations, culminating in a SWOT analysis. The SWOT analysis played a pivotal role in assessing the suitability of the advanced level for each indicator.

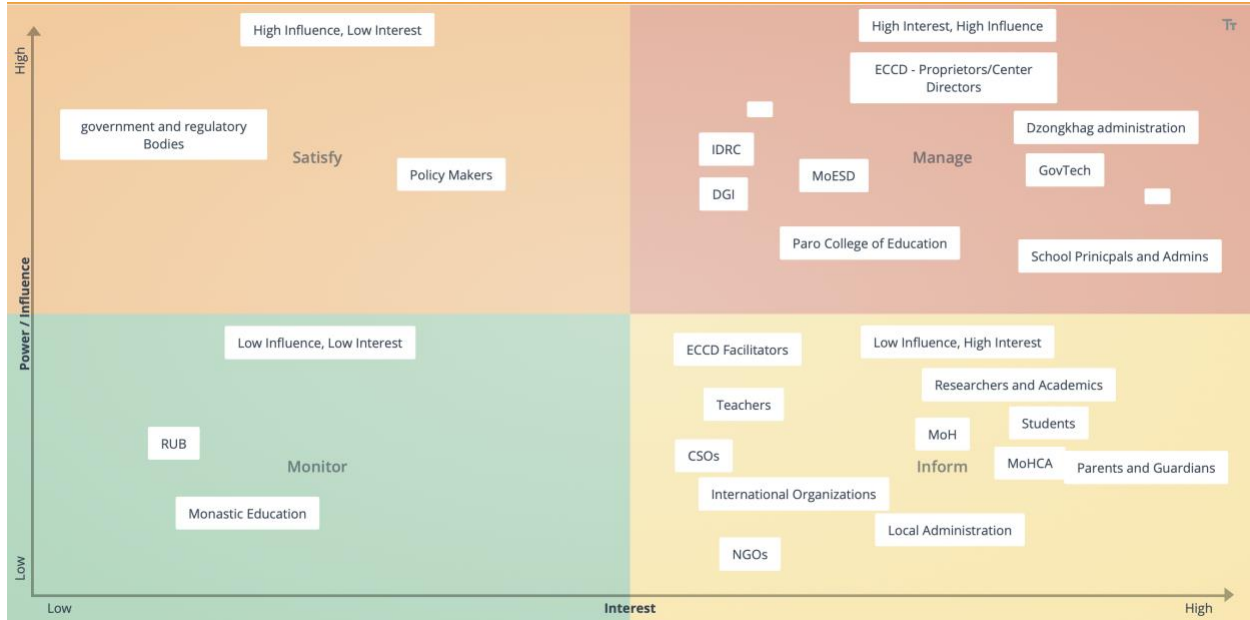
Based on the alignment of the SWOT analysis with the advanced level, the researchers collaboratively calibrated the lower levels (latent, emerging, and established). Subsequently, these calibrated levels were presented for further consultation and endorsement by EMIS stakeholders, including technical experts and managers. Following this consultative process, the final benchmarks were established.

For indicators with multiple sub-indicators, benchmark levels were quantified on a numerical scale: Latent = 1, Emerging = 2, Established = 3, and Advanced = 4. The benchmark level for each main factor was calculated as the average of its sub-factor levels. Similarly, the benchmark for each of the four policy areas was determined by averaging the benchmark levels of their respective leading indicators. Finally, the overall benchmark for the EMIS was computed as the average of the benchmarks across the four policy areas. These benchmarks provided a structured framework for evaluating and monitoring EMIS development (Abdul-Hamid et al., 2014; Cicchinelli, 2016).

### 1.7.3 Power-Interest Matrix and Stakeholder Identification

We used the Power-Interest Matrix to identify stakeholders. We collaboratively identified potential stakeholders and mapped them to appropriate quadrants of the Power-Interest Matrix. Figure 2 presents the stakeholder map.

**Figure 2**  
**Power-Interest Matrix**



As shown in Figure 2, there are different stakeholders according to their power/influence and interest relationship, whether it is data use, data source, data management, or data beneficiaries. We identified schools, GovTech, and MoESD as organizations with high influence and interest among other organizations based on their direct engagements with EMIS. Likewise, we identified DGI as an organization with high influence and interest because of its direct engagement with Motherboard. We collected data using the SABER-EMIS tool and administered it to schools, GovTech, and MoESD personnel directly involved in EMIS management. The SABER-EMIS tool was in its parts to different stakeholders depending on their relationship to the stakeholders' experience. Appendix 3 shows the parts of the SABER-EMIS tools and the stakeholders who were administered the parts. The DGI also used its 24 schools to collect data by administering a survey questionnaire closely related to the SABER-EMIS tool.

### 1.7.4 Sampling Participants

There are 45 ECCD centers, 331 primary schools, 42 lower secondary schools, 57 middle secondary schools, and 93 higher secondary schools, totaling up to 568 schools, with the Ministry of Education and Skill Development at the time of collecting the baseline data for this study (Ministry of Education, 2023). We used the following formula to determine the sample size for the study:

$$n = \frac{N \cdot Z^2 \cdot p(1-p)}{(N-1)E^2 + Z^2 \cdot p(1-p)} \quad \text{Equation (1)}$$

Where:

- N=568
- Z=1.96 (for 95% confidence level)
- p=0.5 (maximum variability)
- E=0.05 (margin of error)
- 

$$n = \frac{568 * 1.96^2 * (.5)(1-0.5)}{(568-1)0.05^2 + 1.96^2 * (0.5)(1-0.5)}$$

Equation (2)

$n = 229$  schools approx

Based on Equation 2, our sample size is 229 schools. We increased this sample size by 52 schools to account for a possible non-responding school, resulting in a final sample size of 281 schools. We determined the sample sizes for different schools by multiplying the ratio of their number to the total schools by the 281 schools. Table 1.2 shows the sample sizes of different schools.

**Table 1.2**  
**Sample Sizes of Different Schools**

School	Number (n)	Ratio (281/n)	Sample Size	Adjusted Ratio	Adjusted Sample Size
ECCD	525	0.50	140	0.10	28
PS	333	0.32	89	0.57	161
LSS	39	0.04	10	0.07	19
MSS	59	0.06	16	0.10	29
HSS	93	0.09	25	0.16	45
Total					282

The initial ratio was adjusted using a weighted approach with weights decided consensually among the MIEMIS team based on the school size, heterogeneity, and homogeneity. The adjusted sample size is the final sample size for the study. There are 20 Dzongkhags (aka districts) in Bhutan, each with different types of schools. Therefore, the final adjusted sample sizes were used to sample the number of schools from each Dzongkhag. With the adjusted sample in place, the within-school sample types were selected using a simple random sampling approach. Table 1.3 shows the final sample size for different schools selected from each Dzongkhag.

**Table 1.3**  
**Number of Schools Sampled from Dzongkhags**

Dzongkhag	ECCD	PS	LSS	MSS	HSS	Total
Bumthang	1	6	0	0	1	9
Chukha	1	13	0	4	2	20
Phuntsholing Throme	0	1	0	0	2	3
Dagana	1	7	1	1	2	13
Gasa	2	1	0	0	0	4
Haa	1	2	1	0	1	5
Lhuentse	1	6	1	0	1	9
Mongar	4	11	0	2	2	21

Paro	0	5	2	1	3	12
Pemagatshel	1	7	1	2	1	12
Punakha	2	5	2	1	2	13
Sjonkhar	2	6	1	2	2	13
Samdrup Jonkhar Throme	0	0	0	0	0	1
Samtse	4	11	2	1	3	21
Sarpang	1	5	0	3	2	11
Gelephu Throme	0	0	0	0	1	2
Thimphu	0	4	0	1	1	7
ThimThrome	0	6	1	3	5	15
Trashigang	1	18	3	2	3	27
Trashiyangtse	0	11	1	0	1	14
Trongsa	1	6	0	0	2	9
Tsirang	1	6	0	1	1	8
Wangdue	4	11	0	0	2	17
Zemgangang	0	12	0	0	1	14
Total	28	161	19	28	45	281

Other stakeholders who participated in the study included Dzongkhag and Thromde Education Officers (22 Officers), GovTech EMIS Officers (One Officer), and MoESD PPD (One Officer) and EMO Officials (One Officer). Their participation was based on their experience with the EMIS.

### Rate of Return

The return rate of the schools and DEO/TEO was 75% and 62%, respectively. The return rates of PPD, GovTech, DSE, and EMD were 100%, respectively.

### 1.7.5 SABER-EMIS Tool

The SABER EMIS questionnaire (Abdul-Hamid et al., 2014) evaluated the 19 indicators outlined in Figure 1. Each indicator is further broken down into sub-indicators, each containing a set of individual items (as detailed in Table 1.4). Each item is presented as a dichotomous question, requiring a "Yes" or "No" response. Importantly, if the respondent answers "Yes" to an item, they are asked to specify the level at which that particular aspect is implemented. This study defines the relevant levels as Ministry, Dzongkhag, and School. To illustrate the format of these items, consider the following example: "Is there a law to create or establish an education management information system (EMIS) that collects, processes, and disseminates education data regularly?" This example demonstrates the structure of the items within the SABER EMIS questionnaire, highlighting the dichotomous response options and the subsequent level selection for "Yes" responses.

**Table 1.4*****Policy Areas and their Factors and Sub-Factors with Total Items***

Policy Area	Indicator	Sub-Indicator (Number of Items)
Enabling Environment	Legal Framework	Institutionalization (4) Responsibility (2) Dynamic framework (2) Data Supply (7) Comprehensive and quality care (7) Data sharing and coordination (2) Utilization (1) Budget (2) Confidentiality (15)
	Organizational Structure and Institutional Processes	(6)
	Human Resources	Personnel (3) Professional development (11)
	Infrastructure Capacity	Data collection means (3) Database (2) Data management system (11) Data dissemination means (2)
	Budget	Personnel and professional development (4)
		Maintenance (1) Reporting (1) Physical infrastructure (1) Efficient use of resources (4)
	Data-driven culture	(2)
System Soundness	Data architecture	(11)
	Data coverage	Administrative data (4) Financial data (5) Human resources data (1) Learning outcome data (5)
	Data analytics	(5)
	Dynamic system	Quality assurance measures (4) Data requirement and considerations (3) System adaptability (1)
	Serviceability	Validity across data sources (15) Integrity of non-educational data bases (3) Archiving data (2) Services to EMIS data (1)
Quality Data	Methodological soundness	Concepts and definitions (7) Classification (3) Scope (8) Basis for recording (4)
	Accuracy and Reliability	Source data (12) Validation of source data (9) Statistical techniques (7)
	Integrity	Professionalism (13) Transparency (9) Ethical standards (3)
	Periodicity and Timeliness	Periodicity (3) Timeliness (2)
Utilization in Decision Making	Openess	EMIS stakeholders (1) User awareness (2) User capacity (3)

	Operational use	Utilization in evaluation (3) Utilization in governance (2) Utilization by school (5) Utilization by clients (2) Utilization by governance (2)
	Accessibility	Understandable data (8) Widely disseminated data (13) Platforms for utilization (3) User support (6)
	Effectiveness in Disseminating Findings	Disseminations strategy (3) Dissemination effectiveness (2)

**1.7.6 SABER-EMIS Tool Administration**

Several steps were taken to ensure the fair and efficient administration of the SABER-EMIS tool. Firstly, the tool was divided into 11 parts, tailored to the specific needs and roles of five participant categories: Dzongkhad Education Officers, School EMIS Managers or Principals, Policy and Planning Division Officers, GovTech Officers, and Education Monitoring Officers. Secondly, these parts were then integrated into Google Forms for online administration. Rigorous quality control measures were implemented, including cross-checking the Google Forms with the original questionnaires to eliminate typographical errors. Thirdly, a pilot test was conducted with the MIEMIS team to identify and address any potential issues. Following this, the Google Forms were revised and finalized. Fourthly, all participants were provided comprehensive training on completing the Google Forms via Zoom. Finally, participants were invited to complete the Google Forms via email. A dedicated hotline was established to address any queries during the response period, which is set at one week.

**1.7.7 Retrieving Responses from Google Forms**

Responses from all 11 Google Forms were meticulously transferred to Microsoft Excel. A robust coding system was developed to streamline data management. Each question was assigned a unique single-digit code or letter, aligning with the questionnaire blueprint used to categorize questions for different stakeholder groups. The coded data was subsequently transferred to SPSS for further analysis.

**1.7.8 Data Analysis with SPSS**

Data cleaning was performed using frequency analysis. Subsequently, descriptive statistics, including frequencies, visualizations, and crosstabulations, were employed to analyze the cleaned data. The analysis aimed to identify general trends, conduct in-depth item-by-item and level-by-level analysis, pinpoint key contradictions, and generate actionable recommendations. A SWOT analysis was also conducted. Each of the four policy areas was dedicated to a separate chapter for a comprehensive presentation.

**1.8 Four Policy Areas**

All combined, the report on the four policy areas consumed over 500 pages. Therefore, the MIEMIS team chose to format independent reports for each policy area, averting reader fatigue and other disadvantages associated with voluminous reports. This format also provides space for prioritizing depth and granularity, providing readers with in-depth insights into specific indicators. This level of detail is crucial for readers seeking a comprehensive understanding of the findings.

However, readers also have the flexibility to focus selectively on an indicator and its sub-indicators. The concepts of the indicators are comprehensible from their items.



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