Turning Data into Impact

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Content

- Processes that link data to learning outcomes
- Assessing Foundational Learning
- Strengthening EMIS:
  - Trends and Innovations: Adaptive Tools and AI in EMIS
  - Key Considerations: Data Security, Ethics, and Cost
- Conclusion

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Two Core Systems

Measurement System

- National assessment
- Assessment of learning especially foundational skills
- Utilize assessment to improve teaching pedagogy and learning process
- Learning at the right level and provide support for all

Data System

- Data for learning and efficiency
- Evidence based management and improvement
- Information must be integrated
- Utilization is key

Why Data Matters in Education?

Monitoring Equity in Education
(Track disparities, support inclusion)

Enhancing Accountability
(School performance, comparisons)

Improving School Management
(Streamline admin & decisions)

Expanding Access to Education
(Enrollment, distance learning)

Enabling Global Reporting
(SDG 4, benchmarking)

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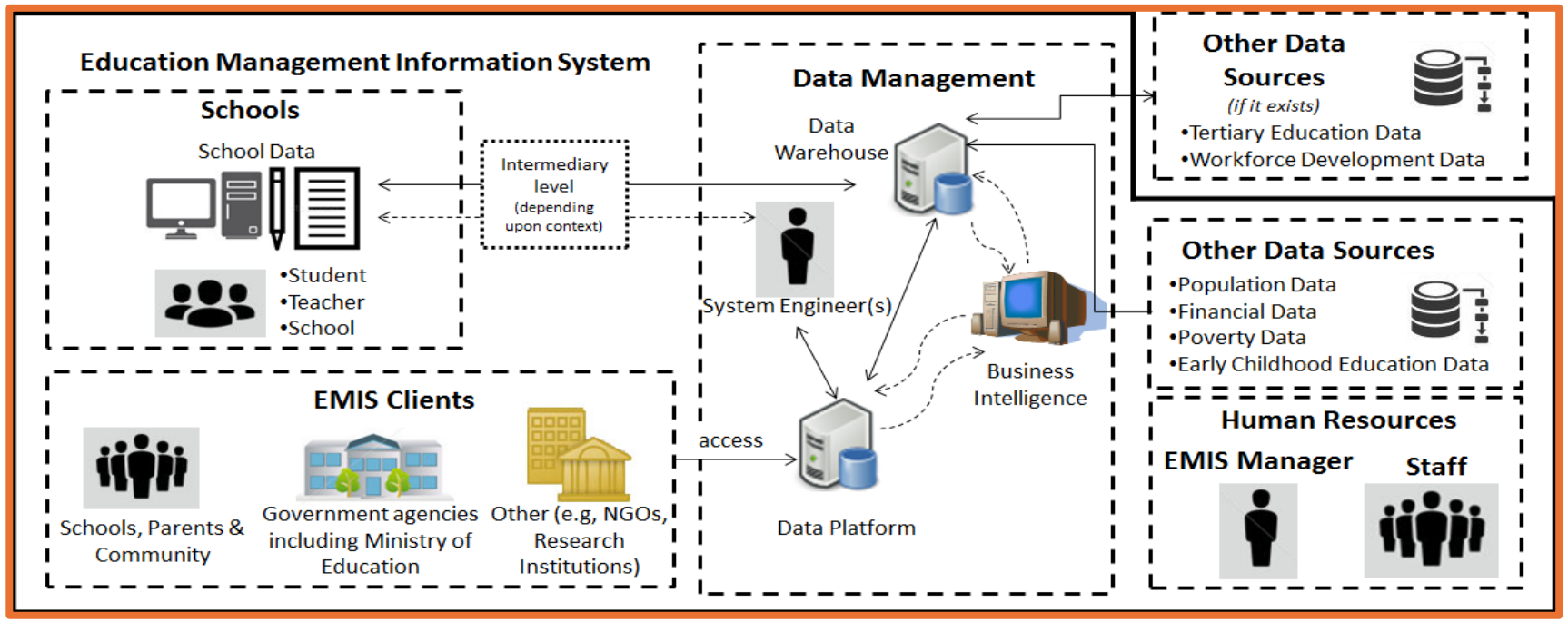
Using EMIS to Strengthen Education Systems

Education Management Information System (EMIS) is an integrated system that collects, analyzes, and shares data on education inputs, processes, and outcomes to inform policy, improve system performance, and enhance learning.

How EMIS Works: From School Data to Smarter Policy Decisions



The value of EMIS lies in how well data is used to drive improvements in learning and inform policy decision

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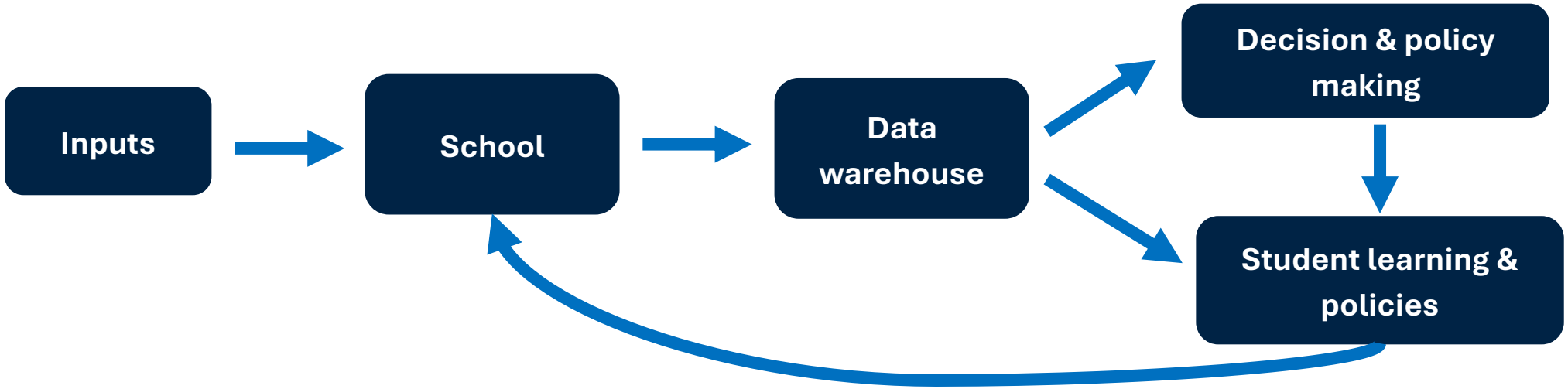
How Education Data Supports Learning and Equity



Data-Driven Decision Making

- Monitor student progress
- Assess and improve curriculum effectiveness
- Support evidence-based policy development

Resource Allocation and Planning

- Targeted funding
- Infrastructure and facilities planning

Teacher Support & Development

- Professional development needs
- Teacher resource allocation
- Teacher evaluations

Personalized Learning and Early Intervention

- Identifying at-risk students
- Tailored instructional strategies & support

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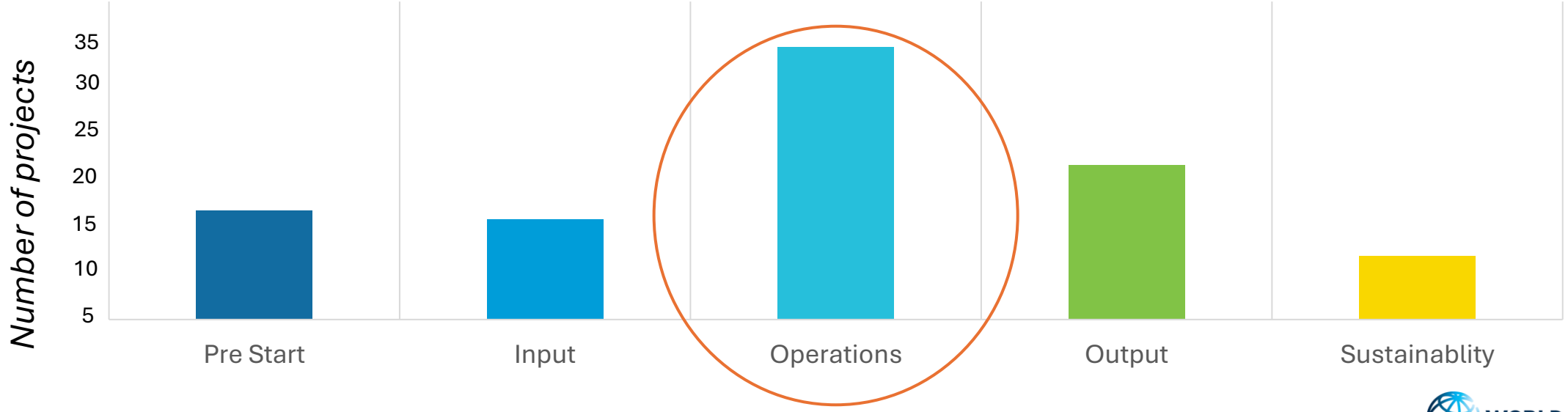
Problems Categorized by EMIS Value Chain

Pre-Start	Input	Operational	Output	Long Term
• Lack of comprehensive vision	• Funding • Technology • Training	• Leadership • Coordination • Capacity	• Data Quality • Data Use	• Culture • Sustainability



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EMIS VALUE CHAIN

Pre-Start	Input	Operational	Output	Long Term
✓ EMIS seen only as tool to allocate school grants ✓ Lack of complete EMIS strategy and supporting policies	✓ Donor funded ✓ Limited EMIS Budget ✓ Poor vendor experience ✓ Lack of training	✓ Local governments not involved ✓ Uncoordinated donor efforts ✓ Not integrated with other units	✓ Validation issues ✓ Weak incentives ✓ No ownership of data ✓ Data not fully used in decision making ✓ No learning information	✓ Data seen as a hammer than torchlight ✓ No investment

What Makes an EMIS Successful?

Enabling Environment	• Legal frameworks, institutional structures, skilled staff, infrastructure, budget, and a data-driven culture.
System Soundness	• Strong architecture, full data coverage, analytics capacity, flexibility, and reliable maintenance.
Quality Data	• Accurate, timely, complete, and methodologically sound data that users can trust.
Utilization for Decision Making	• Accessible data used by all stakeholders for planning, monitoring, and learning

Comparing traditional EMIS and EMIS 2.0

	Traditional EMIS	EMIS 2.0: Moving from compliance to learning
Data collection and entry	Manual, paper-based or basic Excel spreadsheets used widely. school-level entry. Data often collected annually or quarterly	Mostly digital, with mobile data collection apps and real-time; Near real-time or continuous data collection in many systems.
Data quality and timeliness	Delays in data reporting (up to 6–12 months); Frequent inconsistencies and incomplete records.	Faster reporting cycles; dashboards update monthly or in real-time; Improved accuracy via validation rules, AI-based anomaly detection.
Technology and architecture	Centralized, siloed databases/ Limited scalability; poor user interfaces.	Cloud-based, modular, and interoperable systems; Scalable platforms with mobile-friendly, user-centric designs.
Use of data	Primarily used for reporting to donors and compliance. Limited analysis; few policymakers use EMIS directly	Actively used for decision-making, planning, and early interventions. Dashboards, AI insights, and user training make EMIS widely accessible.
Integration with other systems	Little to no integration with health, HR, or finance systems; Weak links to national ID or student tracking	Interoperable with HRIS, finance, learning management systems (LMS), etc.; Increasing use of unique student IDs and GIS-linked school data.
Advanced analytics and AI	Static reports and basic descriptive stats. No machine learning; low use of data science.	AI-powered predictive analytics, dashboards, and real-time alerts; Early warning systems, dropout prediction, and learning outcome analysis.
Inclusivity and coverage	Often excluded refugees, private schools, or non-formal education	Expanding to include marginalized groups, refugee learners, and remote schools.
User engagement and training	Limited training, mostly central-level use; EMIS seen as bureaucratic or top-down.	Wider capacity-building at district, school, and even teacher levels. Now seen as a planning and support tool for schools and systems.

Learning Poverty and SDG 4

Learning Poverty

The percentage of 10-year-olds unable to read and understand a simple story. It measures foundational reading skills & highlights a global education crisis 🎯

SDG 4 Goal: “Ensure inclusive and equitable quality education for all.”

Key Targets Linked to Learning Poverty:

- 4.1: Universal primary and secondary education
- 4.6: Literacy and numeracy for youth and adults

🌍 The Global Learning Crisis (as of 2022)

- 57% of children in LMICs are in learning poverty
- >90% in low-income countries
- COVID-19 worsened the crisis

🛠️ Solutions:

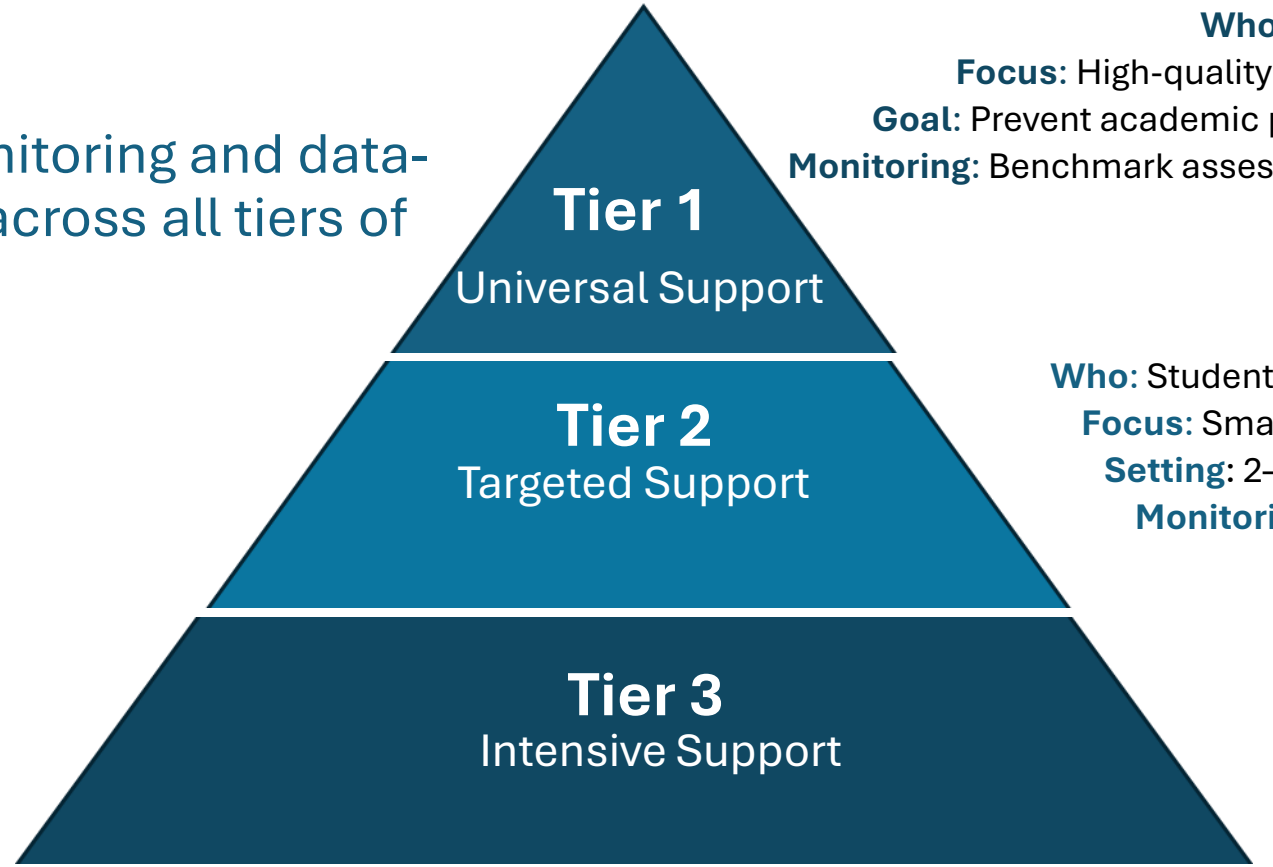
- Strengthen early grade reading
- Invest in teacher training
- Provide learning materials
- Use data for improvement
- Scale remedial programs

🎯 Goal: Cut learning poverty in half by 2030

- A joint mission by the World Bank, UNESCO, and UNICEF

Multi-Tiered System of Support (MTSS)

EMIS enables real-time monitoring and data-informed decision-making across all tiers of student support.



Who: All students
Focus: High-quality instruction
Goal: Prevent academic problems
Monitoring: Benchmark assessments

Who: Students not progressing in Tier 1
Focus: Small group instruction
Setting: 2–3 sessions/week
Monitoring: Frequent progress checks

Who: Students with persistent challenges
Focus: Individualized, intensive support
Setting: 1:1 or very small groups
Monitoring: Daily or weekly

MTSS integrates academic and behavioral support, using EMIS data to target needs and monitor progress

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Response to Intervention (RTI) Systems Support Early Literacy and Reduce Special Education Referrals

RTI in U.S. Schools (K–3 Focus)

- Mandated under IDEA (2004) to support struggling students.
- Integrated into MTSS: combines academic & behavioral support.
- Most used in **reading**, growing in **math** and **writing**.
- **RTI data** helps distinguish between learning disabilities and instructional gaps.

RTI-Inspired Model: Room to Read (India)

- **Tier 1:** All students get foundational reading with structured storybooks and teacher training.
- **Tier 2:** Struggling readers receive small group instruction.
- **Tier 3 (informal):** Peer support or tutoring in low-performing schools.
- **Monitoring:** Baseline + fluency/comprehension checks every few months.

Global Relevance

- **Canada** uses RTI data in inclusive education frameworks.
- **Australia & the UK** apply similar tiered support models under different names.

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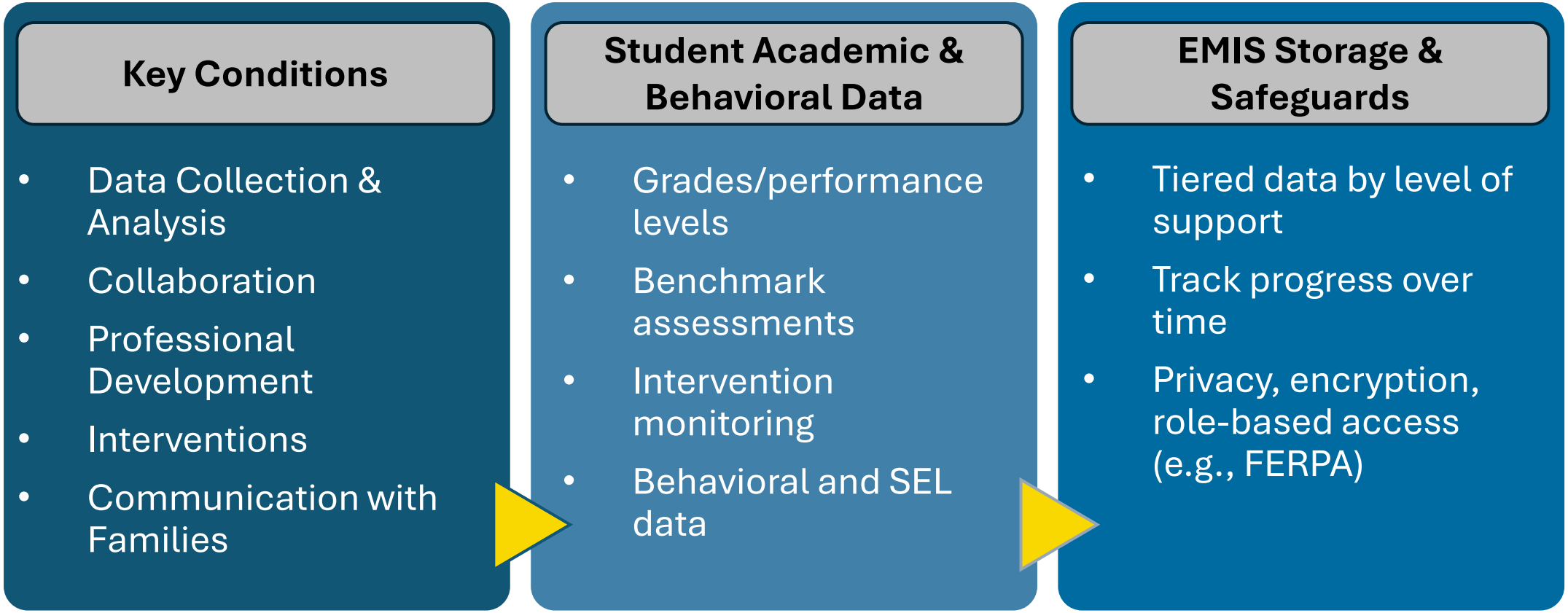
How EMIS Enables Data-Driven Student Support in RTI/MTSS Systems



EMIS enables a continuous data cycle *— collecting, using, and protecting student-level data to inform timely and effective support for academic and behavioral needs.*

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Trends in Data Use to Support All Children Achieve Strong Foundational Learning

AI and machine learning for predictive analytics

Real-time dashboards for personalized learning

Data driven tutoring services

Cross-sector data integration and harmonization of programs for better (e.g., health, social services, incentive systems)

Data and Digital Tools Supporting Refugee Students

Real-world innovations helping refugee children access, engage, and succeed in education

Country	Initiative & Results
Jordan	Math App to improve skills among Syrian and Jordanian students
Kenya	Vodafone Instant Classroom led to **15% improvement in attendance** (Dadaab camp)
Chad	Enhanced EMIS enables better **educational planning** for refugee populations
Türkiye	Language & mental health-focused program improved Turkish and Math outcomes; reduced absences

Global Examples

- **UNESCO–UNHCR collaboration** helps integrate refugees into national EMIS
- **Global advocacy**: Push for inclusion of refugees in **national data systems** for better planning and services

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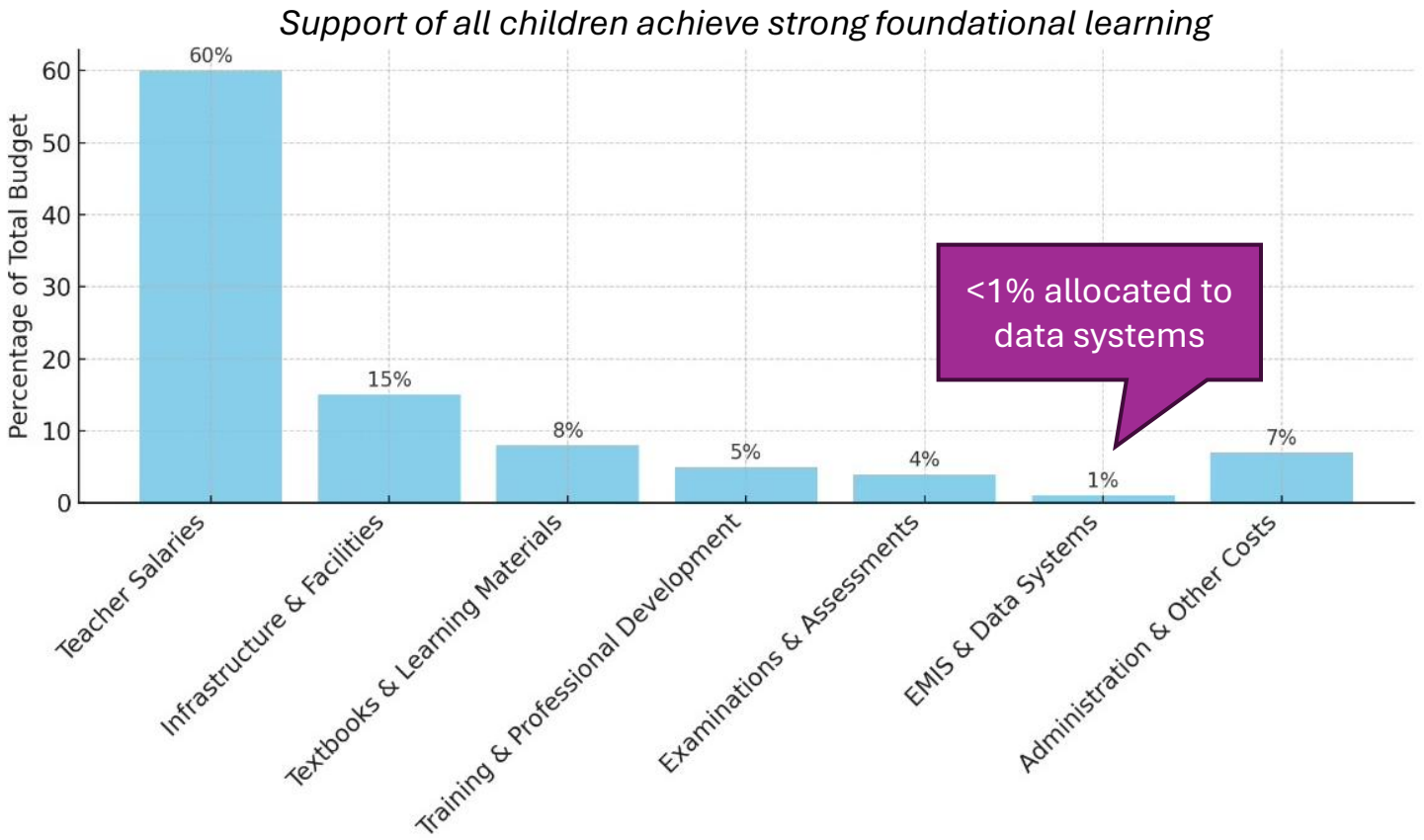
Investing in EMIS Is Essential to Strengthen Education Systems

EMIS receives <1% of education budgets in many countries — despite its role in supporting planning, equity, and learning outcomes



Data systems are essential for delivering, monitoring, and improving foundational learning — yet remain severely underfunded

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Estimated Cost Breakdown for AI-Enhanced EMIS Implementation

- **System Design and Development**
  - Needs Assessment: $20,000 – $100,000
  - System Architecture & AI Model Design: $100,000 – $500,000
  - Software Licensing: $50,000 – $200,000/year
- **Infrastructure Setup**
  - Cloud Services / Hosting: $30,000 – $150,000/year
  - Hardware: $100,000 – $500,000
  - Internet Connectivity: $50,000 – $300,000
- **Data Integration & Management**
  - Data Cleaning & Migration: $50,000 – $200,000
  - Interoperability with National Systems: $50,000 – $150,000
  - AI Data Pipelines: $40,000 – $120,000
- **Capacity Building & Training**
  - Central-Level Training: $30,000 – $100,000
  - School-Level Training: $100,000 – $300,000
  - Technical Support Contracts: $30,000 – $80,000/year
- **AI Model Development & Testing**
  - Predictive Analytics: $50,000 – $150,000
  - NLP Tools: $30,000 – $80,000
  - Dashboard Visualization: $20,000 – $100,000
- **Monitoring, Evaluation, and Learning (MEL)**
  - Baseline & Endline Studies: $50,000 – $150,000
  - System Usage Analytics: $20,000 – $70,000
  - Independent Evaluation: $100,000 – $200,000
- **Total Estimated Costs**
  - Pilot Project (100–200 schools): $500,000 – $1.5 million
  - Mid-Scale (500–1,000 schools): $2 million – $5 million
  - National Scale (2,000+ schools): $5 million – $10+ million

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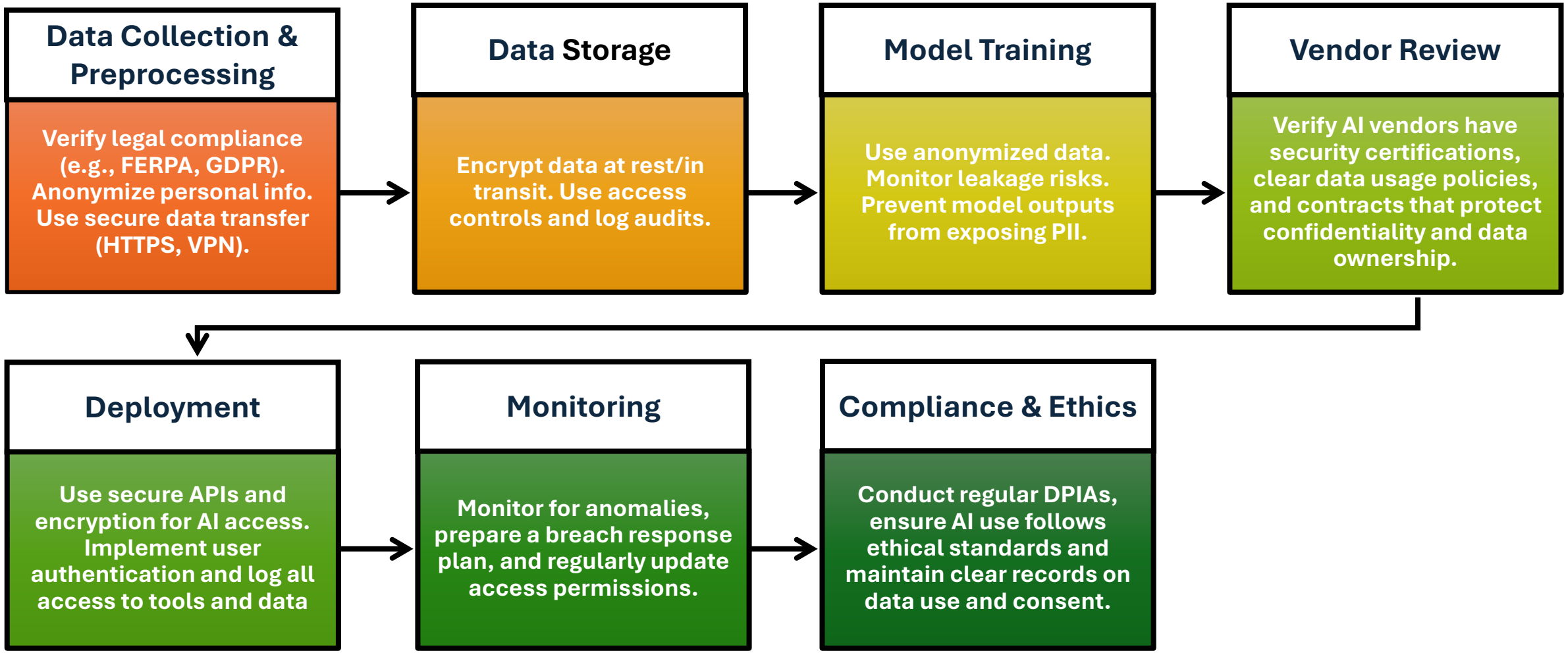
Ensuring Data Security When Using AI in Education

A step-by-step checklist to protect student data and uphold ethical use of AI tools



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Using Data Responsibly: Ethical and Practical Guidelines

Key considerations for privacy, transparency, and safeguarding learning integrity

Data & Consent

Informed Consent

Clearly explain how AI will be used in learning. Get explicit consent for collecting personal data or learning behavior, and offer opt-out options when possible.

Privacy & Data Protection

Securely collect, store, and process student data using AI tools that follow FERPA or GDPR. Limit data collection to what's needed for learning goals.

Transparency

Be transparent about AI's role in content, feedback, or assessments. Help students understand its capabilities and limitations to prevent over-reliance.

Bias & Oversight

Bias Mitigation

Regularly check AI tools for bias in content, feedback, or grading. Ensure they promote inclusivity and don't disadvantage any student group.

Human Oversight

AI should support—not replace—teachers. Educators must monitor AI outputs and step in to ensure accuracy and relevance.

Pedagogical Alignment

Use AI tools that align with learning goals and enhance instruction—avoid adopting tech for novelty alone.

Student Empowerment

Feedback & Improvement

Gather feedback from students and teachers, and refine AI use based on outcomes and ethical considerations.

Digital Literacy Education

Encourage students to engage critically with AI, understand its limits, and reflect on its impact on their learning and data

Conclusion

- ✓Strong integrated Learning Assessment and EMIS systems are essential to improve schools and learning quality and equity.
- ✓Investing in the system infrastructure, training at all levels, and improving the culture of utilizing data are key
- ✓Data strategy, policies and legal framework are crucial
- ✓Think of sustainability
- ✓Don’t reinvent the wheel (learn from others and share tools)

Thank You!

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