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Beyond Political Reshuffles, Renew Education in India

Context

- India's educational future is presented as **a question of national importance** rather than political convenience.
- Against the backdrop of Sonam Wangchuk's indefinite fast, the focus shifts from ministerial accountability to the urgent need for systemic reform.
- The central argument is that only **a transformed education system** can convert India's demographic dividend into long-term national progress through quality education, innovation, and responsible citizenship.

The Symbolism of Sonam Wangchuk's Fast

- Sonam Wangchuk's hunger strike symbolizes **personal sacrifice** for a larger public cause.
- His weakening health represents a moral appeal to awaken the nation's conscience.
- Inspired by non-violent ideals, the fast calls for meaningful educational transformation instead of temporary political responses, making it **a test of India's collective responsibility**.

Critique of Political Short-Termism

- Replacing an Education Minister may satisfy immediate political demands but cannot resolve deep-rooted institutional problems.
- Institutions shape generations, whereas political leaders are temporary.
- Sustainable progress depends on long-term accountability, consistent policymaking, and structural reforms rather than changes in leadership.

Education and the Demographic Dividend

- A true demographic dividend is achieved by nurturing critical thinkers, innovators, ethical leaders, researchers, skilled teachers, and responsible citizens.
- While access to education has expanded, learning quality has not improved proportionately.
- National development requires excellence in education rather than merely increasing enrolment.

The Path Forward Toward Long-Term Reform

• Reforming the Examination and Coaching System

- The present examination system encourages **rote learning**, making memorization more valuable than understanding.
- Competency-based assessments should promote **conceptual understanding**, creativity, analytical reasoning, ethical judgement, and **problem-solving**.
- Simultaneously, reducing dependence on coaching through redesigned entrance examinations and greater importance to school performance can restore confidence in formal education.

• Strengthening Teachers and Public Education

- No education system can exceed the quality of its **teachers**.
- A National Teacher Excellence Mission should improve teacher preparation, continuous professional development, research opportunities, and professional respect.
- Equally important is strengthening government schools with quality **infrastructure**, laboratories, libraries, digital facilities, sanitation, and adequate staffing to ensure equal educational opportunities for every child.

• Academic Freedom, Transparency, and Investment

- Educational institutions require greater **academic freedom** to innovate in teaching, curriculum, and research while remaining accountable for learning outcomes.
- A national education dashboard can improve **transparency** by tracking performance indicators such as learning outcomes, infrastructure, teacher vacancies, and employability.
- Sustained **investment** is equally important. Increasing public expenditure to **6% of GDP** for education and **2% of GDP** for **research funding** would strengthen schools, universities, laboratories, and India's transition into a **knowledge economy**.

• Education Beyond Politics

- Educational reform should remain above political ideologies and electoral cycles.

- An independent National Education Reform Commission can establish measurable benchmarks, monitor implementation, publish progress reports, and ensure policy continuity.
- A **bipartisan** approach would enable education to become a genuine national mission.

Conclusion

- India stands at a crucial moment where **reform, renewal, and a true educational renaissance can shape the future of coming generations.**
- Sonam Wangchuk's sacrifice serves as a powerful reminder that lasting change demands collective commitment rather than temporary political action.
- By strengthening institutions, investing in education, empowering teachers, ensuring equal opportunities, and pursuing long-term reforms, **India can build an education system worthy of its aspirations** and unlock its full national potential.

Beyond Political Reshuffles, Renew Education in India FAQs

Q1. What does Sonam Wangchuk's fast symbolize?

Ans. Sonam Wangchuk's fast symbolizes personal sacrifice and a moral appeal for comprehensive educational reform.

Q2. Why is institutional reform more important than changing ministers?

Ans. Institutional reform is more important because strong institutions ensure long-term educational progress beyond political changes.

Q3. How can the examination system improve learning?

Ans. The examination system can improve learning by assessing conceptual understanding, creativity, and problem-solving instead of rote memorization.

Q4. Why are teachers considered the foundation of educational excellence?

Ans. Teachers are the foundation of educational excellence because the quality of education depends largely on the quality of teaching.

Q5. Why should education remain above politics?

Ans. Education should remain above politics to ensure continuous reforms and long-term national development regardless of changes in government.

Source: **The Hindu**

Securing Connected Battery Systems - Strengthening India's Cyber-Physical Security Framework

Context

- The recent **incident in Delhi**, where certain **e-rickshaws** were remotely disabled through vulnerabilities in their Battery Management Systems (BMS), has highlighted a new dimension of cyber-physical security.
- While the controversy initially centred on Chinese-origin applications, the episode underscored **a deeper challenge**—the cybersecurity of software-defined, connected battery systems.
- As batteries increasingly power **critical infrastructure**, India requires a comprehensive regulatory framework to ensure their digital resilience.

Why the Incident Matters

- Certain diagnostic applications exploited weak authentication and default Bluetooth credentials in BMS, enabling **unauthorised access**.
- The apps were originally designed for battery diagnostics, maintenance and health monitoring, but poor access controls allowed **misuse**.
- This represents India's **first** prominent cyber-physical security incident involving connected battery systems.
- The core concern is insecure system design, not merely the country of origin of the software.

Growing Importance of Connected Battery Systems

- Modern batteries are no longer passive storage devices but software-controlled, network-connected systems used in –
 - EVs and e-rickshaws
 - Grid-scale Battery Energy Storage Systems (**BESS**)
 - Telecom towers
 - Warehouses and ports
 - Industrial automation
 - Defence platforms
- A successful cyberattack on such systems could disrupt essential services, threaten public safety and undermine critical infrastructure.

Current Institutional Framework in India

- **Indian Computer Emergency Response Team (CERT-In)**
 - It issues cybersecurity advisories and incident response guidelines.
 - Promotes secure software development frameworks, coordinated vulnerability disclosure, Software Bills of Materials (SBOMs), and security guidance for AI-assisted software vulnerabilities.
 - **Limitation:** Guidelines remain largely **non-binding** and do not prescribe cybersecurity standards specifically for connected BMS.
- **National Critical Information Infrastructure Protection Centre (NCIIPC)**
 - Protects critical sectors such as power, transport, and telecommunications.
 - Covers battery storage systems only when integrated into designated critical infrastructure.
 - **Limitation:** Consumer batteries, EVs, commercial storage systems and e-rickshaws remain largely outside its jurisdiction.
- **Sectoral regulators**

- **Central Electricity Authority (CEA):** Focuses on organisational cybersecurity and functional safety.
- **Department of Telecommunications (DoT) and MeitY:** Introduced security assurance mechanisms for connected devices, including authentication, secure software updates, and vulnerability disclosure.
- **Gap:** Existing standards do not explicitly address Bluetooth-enabled BMS or battery-management applications.
- **Automotive safety standards**
 - Following EV fire incidents, India introduced AIS-156 and AIS-038 Rev.2.
 - These primarily address battery fires, thermal propagation, electrical abuse, and mechanical safety.
 - Recently introduced **AIS-189** establishes vehicle cybersecurity management requirements throughout the vehicle lifecycle.
 - **Limitation:** Its coverage does not adequately extend to many electric two-wheelers and e-rickshaws using connected BMS.

Regulatory Gaps and Importance of Digital Supply Chain Security:

- **Major regulatory gaps**
 - Absence of a **unified** cybersecurity framework for connected battery systems. Weak authentication and access-control mechanisms in BMS.
 - Limited **oversight** of software vulnerabilities in battery products. Fragmented institutional responsibilities.
 - Insufficient **regulation** of digital supply chains involved in battery manufacturing.
- **Importance**
 - Modern batteries involve globally distributed components – hardware, firmware, Cloud services, and software libraries maintained by multiple developers.
 - Therefore, battery security depends not only on physical components but also on the **integrity**, traceability and security of the digital supply chain.

Global Best Practices

- **US:** Secure Software Development Framework (SSDF); Software Bills of Materials (SBOMs); emphasis on software provenance, lifecycle security and vulnerability management.
- **EU:** Cyber Resilience Act; Digital Battery Passport; focuses on firmware integrity, software traceability and lifecycle monitoring.
- **United Kingdom:** The Product Security and Telecommunications Infrastructure (PSTI) Act mandates ban on default passwords, responsible vulnerability disclosure, and transparency regarding software security support.

Way Forward for India

- Rather than creating an entirely new regulatory regime, India can strengthen its existing framework by –
 - Integrating CERT-In guidelines into battery standards.
 - Mandating Software and Hardware Bills of Materials (**SBOM/HBOM**) for battery products.

- Enforcing secure software development practices throughout battery manufacturing.
- Requiring rigorous testing and verification of imported hardware, firmware and software.
- Strengthening authentication, encryption and access-control mechanisms for BMS.
- Establishing lifecycle cybersecurity **audits** for connected battery products.
- Promoting coordinated vulnerability disclosure and timely software updates.

Conclusion

- The Delhi e-rickshaw incident illustrates that India's expanding digital infrastructure faces emerging cyber-physical risks.
- Therefore, **a comprehensive framework** will strengthen India's technological resilience while ensuring that digital trust—not geopolitical origin—becomes the foundation of battery security.

Securing Connected Battery Systems FAQs

Q1. Why do connected BMS pose a new cyber-physical security challenge for India?

Ans. Because vulnerabilities in software-defined battery systems can disrupt critical infrastructure.

Q2. What are the major gaps in India's regulatory framework for connected battery systems?

Ans. Fragmented institutional oversight, non-binding cybersecurity guidelines, weak authentication standards, etc.

Q3. How do global regulatory frameworks strengthen the cybersecurity of connected battery systems?

Ans. They mandate secure software development, Software Bills of Materials (SBOMs), supply-chain traceability, etc.

Q4. Why is digital supply chain security crucial for modern battery systems?

Ans. Because batteries rely on globally sourced hardware, firmware, software and cloud services.

Q5. What should be India's approach to securing connected battery systems?

Ans. India should mandate secure software practices and SBOMs, strengthen authentication, etc.

Source: **IE**

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