Governing AI in Education: A Cross-Organization Analysis of International Policy, Law, and Standards*

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Abstract

Generative AI is quickly diffusing in schools and universities, prompting international organizations to issue sectoral guidance, binding rules, and technical standards to steer safe and equitable use. However, these instruments vary in scope and strength, creating a need for a cross-organization synthesis focused on education. We conducted a document-based comparative policy analysis of publicly available instruments issued by UNESCO, OECD, UNICEF, the Council of Europe, the European Union, the World Bank, and standards bodies (ISO/IEC; CEN-CENELEC). The corpus included education guidance, cross-sector principles, binding law (EU AI Act; CoE convention), and operational standards (ISO/IEC 42001; ISO/IEC 23894). Instruments were coded against standard governance dimensions and cross-walked to relevant standards. We find broad convergence on human-centred, rights-based aims and safeguards for transparency, accountability, and children's data. Persistent gaps include education-specific indicators for monitoring and implementation support for low-resource contexts. International AI policy for education is consolidating into a layered model: sectoral guidance (UNESCO/OECD/UNICEF), binding rights-based law (CoE; EU AI Act), and standards-led operationalisation. Scientifically, the synthesis links normative principles to enforceable obligations and auditable practices. It supports near-term steps for ministries and institutions.

Keywords

AI governance, AI policy, education policy, AI in education

1. Introduction

Artificial intelligence (AI), especially generative AI, has diffused across countries with unusual speed, reaching hundreds of economies and altering practices in schools and universities. Recent cross-country evidence shows rapid global uptake, with usage patterns skewed toward younger and more educated users but strong adoption in many middle-income economies [1]. This underscores opportunity and uneven access. At the same time, major reviews of technology in education caution that evidence of impact is mixed and context dependent, and call for stronger governance to ensure equity and effectiveness [2]. These trends make policy guidance for AI in education urgent and consequential.

International organizations (IOs) have begun to play a central role in setting common expectations for trustworthy AI in education. UNESCO has issued global guidance for generative AI in education, building on earlier sector-specific instruments [3]. The OECD's intergovernmental AI Principles provide a cross-sector foundation for human-centred and trustworthy AI [4]. UNICEF has articulated child-rights requirements relevant to schooling [5]. The Council of Europe (CoE)

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opened for signature the first international, legally binding AI treaty grounded in human rights [6]. The European Union (EU) adopted the AI Act, a comprehensive, risk-based regulatory framework relevant to education providers and vendors [7]. In parallel, international standards bodies have introduced management and risk frameworks (ISO/IEC 42001, ISO/IEC 23894) that many systems and suppliers can use to operationalize governance [8, 9].

Education policy debates focus on concrete risks and safeguards. These risks and safeguards include the protection of children's data and well-being, academic integrity and assessment, transparency of automated decisions, and the capacity of teachers and institutions to use AI responsibly. Recent instruments address these concerns from different angles, for example, the EU AI Act prohibits emotion-recognition systems in educational settings [7], UNESCO's guidance outlines near-term actions for assessment and integrity [3], and UNICEF's policy guidance centers on child rights considerations for profiling and data use [5].

The landscape remains fragmented across binding regulation, soft law guidance, and voluntary standards, with uneven specificity for classroom practice, procurement, evaluation, and support for low-resource contexts [10]. IOs highlight the need to link governance with implementation support, funding, capacity-building, and practical toolkits, so that policies translate into improved teaching and learning rather than technology-first adoption. Standards such as ISO/IEC 42001 and 23894 can help organizations operationalize risk management and continuous improvement, but the availability of resources and evidence still varies widely across systems.

This paper addresses these gaps by systematically analyzing publicly available documents issued by international organizations that shape AI policy in education. It maps convergence and divergence across instruments, identifies coverage gaps, and considers how cross-sector frameworks, education-specific guidance, and international standards can be aligned to support equitable, evidence-informed adoption.

2. Materials and Methods

We conducted a document-based comparative policy analysis of publicly available instruments on AI in education issued by IOs. The approach combines a scoping-review style search and screening process to build the corpus, qualitative content analysis, and structured comparative coding. This design is appropriate for synthesizing heterogeneous policy texts and mapping areas of convergence, divergence, and gaps.

We included instruments produced or sponsored by: UNESCO, OECD, CoE, EU, UNICEF, the World Bank, and ISO/IEC JTC 1/SC 42. We targeted education-specific guidance, cross-sector AI principles, legally binding instruments, child-rights policy guidance, system-readiness and governance perspectives, and AI management/risk standards within these bodies.

To capture the current governance baseline, we limited inclusion to documents published or last updated between 2018 and September 2025. English-language versions were prioritized, and we used the English text for coding where multiple official languages existed.

We ran structured searches across official IO domains and open repositories using combinations of terms such as "AI AND education policy," "guidance," "framework," "treaty," and "standard." We retrieved documents directly from authoritative pages. We also captured World Bank briefs and reports on system-level governance and implementation.

Included items were produced or endorsed by the target IOs, addressed AI uses in education or contained cross-sector provisions with clear implications for education systems, and were in the form of final texts, official drafts, or formally adopted standards. We excluded news articles, opinion pieces, vendor white papers, and items without public access. Screening proceeded in two stages (title/abstract/webpage, then full-text).

We developed an a priori codebook aligned to recurrent policy dimensions in IO instruments: objectives and values (rights, human-centric framing), scope and definitions, risk taxonomy and prohibitions/constraints, transparency and accountability, data governance and child rights, assessment and academic integrity, teacher capacity and professional development, procurement,

assurance, and conformity assessment, monitoring, evaluation, and impact indicators, and implementation supports.

We constructed organization-by-dimension matrices that enable side-by-side comparisons of coverage depth, instrument strength, and education specificity. Findings were synthesized through constant comparison to identify convergences, divergences, and coverage gaps across IOs, with illustrative excerpts traced to source documents. Content-analytic procedures follow established practice for transparency and replicability.

Because standards function as operational complements to policy and regulation, we coded ISO/IEC 42001 and ISO/IEC 23894 and cross-walked their requirements to governance dimensions and regulatory references where applicable. This allowed us to examine how standards can operationalize IO guidance within education systems and vendors.

3. Results

Across the corpus of documents reviewed, IOs now agree that governing AI in education requires a mix of binding rules, standards, and practical guidance that can be adapted to local contexts. Collected sources let us triangulate how scope, obligations, and support mechanisms are crystallizing for education systems. The overview of documents is presented in Table 1.

Table 1
Overview of international instruments relevant to AI in education

Organization	Flagship instrument	Legal force	Education scope	Current timeline
UNESCO	Guidance for Generative AI in Education & Research (2023; landing page updated 2025)	Soft-law guidance	Sector-specific: immediate actions, long-term policy, human-centred aims (equity, inclusion, teacher capacity)	Live guidance; updated landing summary (Apr 14, 2025)
OECD	Digital Education Outlook 2023 (incl. “Emerging governance of GenAI”), Education Policy Outlook 2024–25	Analytical/ scoping guidance (non-binding)	Cross-country governance of GenAI, teacher capacity, curriculum/assessment shifts	Ongoing series; 2023 full report and 2024–25 updates on teaching & curriculum
UNICEF	Policy Guidance on AI for Children (2021)	Soft-law guidance	Child-rights requirements applicable to schooling (privacy, profiling, fairness)	Stable reference text and explainer hub

CoE	Framework Convention on AI, Human Rights, Democracy & Rule of Law (CETS No. 225, opened 2024)	Binding international treaty	Rights-based baseline for public/private AI, applicable to education authorities	Opened for signature Sep 5, 2024; signatures & ratifications tracked by CoE
EU	AI Act (Regulation (EU) 2024/1689)	Binding regulation (risk-based)	Explicit coverage of "education and vocational training" as high-risk; bans emotion-inference in education	Entered into force Aug 1, 2024; prohibitions & AI-literacy from Feb 2, 2025; GPAI duties from Aug 2, 2025; most high-risk rules from Aug 2, 2026; some embedded cases to Aug 2, 2027
World Bank	AI in Education briefs and HE reports (2024–25)	Analytical/ policy briefs (non-binding)	System readiness, use cases (tutoring, teacher support), LMIC perspectives	Active program with 2024–25 briefs and regional reports.
Standards (ISO/IEC; CEN-CENELEC)	ISO/IEC 42001:2023 (AI management systems); ISO/IEC 23894:2023 (AI risk management); EU harmonized standards pipeline via CEN-CENELEC JTC 21	Voluntary standards (presumption of conformity once harmonised in EU)	Operational scaffolding for governance, risk, oversight, assurance in education providers & vendor products	ISO/IEC published; EU harmonised standards in development; JRC brief summarises 37 activities for the AI Act

There is growing alignment on both foundational concepts and on who bears responsibility. The EU AI Act supplies formal definitions and assigns duties to "providers" and "deployers" [7]. At the same time, UNESCO's guidance stresses human agency, inclusion, and equity [3], and UNICEF reframes obligations through the Convention on the Rights of the Child [5]. A notable novelty is the Act's Article 4 requirement that organizations ensure a "sufficient level" of AI literacy for staff and others using systems on their behalf. This expectation fits the education sector's need for teacher capability rather than tool bans alone.

The analysis indicates that governance instruments are stratified. OECD's cross-country review finds that, as of 2024, most jurisdictions relied on non-binding school or ministry guidance for GenAI, with only a minority proposing sector-specific regulation [4]. The EU has enacted cross-sector binding rules covering education use cases. The Council of Europe opened a legally binding human-rights convention on AI to global signatories in September 2024 [6]. This mix confirms a pattern: soft guidance to shape school practice, anchored by harder horizontal law to protect rights and set market obligations.

Substantive priorities are remarkably consistent across organizations. OECD reports that governments prioritize data protection and privacy, alongside accuracy/reliability, transparency/explainability, fairness/bias mitigation, and (in many systems) worries about skill attrition. Likewise, UNESCO emphasizes equity, human agency, and responsible data use. UNICEF

sets nine requirements for child-centred AI. These sources show a stable core of policy concerns that inform institutional rules, procurement, and classroom practice.

Education-specific legal risk classification is clearest in the EU. The AI Act treats several education uses as "high-risk," including systems for admission/assignment, grading and evaluation (including proctoring), and other use cases that can materially influence an individual's educational trajectory. It also prohibits emotion-inference in educational settings. Application is phased: prohibitions and AI-literacy duties began on 2 February 2025, obligations for general-purpose AI and governance applied from 2 August 2025, and most remaining provisions apply as of 2 August 2026, with extended dates for certain high-risk categories. These dates create a tangible compliance horizon for ministries, school networks, exam bodies, and vendors. The overview of EU AI Act items connected to education is presented in Table 2.

Table 2
EU AI Act items most salient to education actors (procurement, compliance, and timing)

Topic	What it means for ministries, school systems, HEIs, and vendors	Where it is in the Act
Prohibited practices in education	Do not procure or deploy emotion-inference in classrooms/exams; avoid biometric scraping and sensitive biometric categorisation.	Art. 5 prohibitions; EU summary page confirms education/workplace context.
High-risk education uses	Admissions/assignment, evaluation/steering (incl. automated grading), level-setting, and proctoring fall under high-risk: require risk mgmt, data governance, technical docs, human oversight, logging, post-market monitoring; registration before public-sector deployment.	EUR-Lex AI Act & Annex III overview.
AI literacy	Providers and deployers must ensure a sufficient level of AI literacy for staff/users. Institutions should evidence staff training and student-facing guidance.	Article 4 text; Commission FAQ on AI literacy.
General-purpose AI duties (foundational models)	Model providers must publish training-data summaries, meet security/testing duties (more for "systemic-risk" models). Downstream ed-tech vendors and institutions should request these disclosures from providers.	EU AI Act GPAI section & application timeline.
Application timeline	In force Aug 1, 2024 - Prohibitions & AI-literacy from Feb 2, 2025 - GPAI from Aug 2, 2025 - High-risk most duties from Aug 2, 2026 (embedded product cases to Aug 2, 2027). Plan procurement and updates accordingly.	Commission "AI Act" page (timeline).

Standards & assurance	Use ISO/IEC 42001 (AIMS) and 23894 (risk mgmt) now to prepare; watch for CEN-CENELEC JTC 21 harmonized standards that will grant presumption of conformity once cited in the OJEU.	ISO pages; JRC brief on harmonised standards; CEN-CENELEC overview.

Standardization is becoming a bridge between legal requirements and school-system practice to support implementation. ISO/IEC 42001 establishes an AI management system framework that organizations can adopt to operationalize policies and controls. ISO/IEC 23894 provides risk-management guidance across the AI lifecycle. In the EU, CEN-CENELEC JTC 21 is drafting harmonised standards that, once cited in the Official Journal, confer a presumption of conformity with the Act [11]. JRC's 2024 Science for Policy brief explains the expected characteristics of these standards and how they will complement existing ISO/IEC work.

Capacity building and AI literacy emerge as cross-cutting levers. The OECD recommends integrating GenAI into teacher training and providing national resources that cover technical, pedagogical, and ethical dimensions. The EU's Article 4 obligation makes literacy a legal duty for providers and deployers, applicable since February 2025. These policies suggest that teacher professional learning, not point solutions, has become the policy baseline, and that institutions should document literacy programmes as part of compliance evidence.

Assessment and academic integrity are focal stress points where guidance is evolving. UNESCO encourages redesigning assessment and coursework rather than relying on detection alone. The OECD documents that many countries allow teacher use of GenAI and are experimenting with restrictions around high-stakes exams while encouraging teacher training and providing exemplars of classroom use. The overall pattern is a shift from "ban or detect" toward assessment redesign, transparency to students, and clear exam protocols.

Equity considerations are central in international guidance. UNICEF's policy document emphasizes non-discrimination, inclusion, and safeguards tailored to children's rights. UNESCO's policymaker guidance and related background analyses highlight digital divides and potential harms to young people if AI is deployed without attention to rights, well-being, and access. For education systems, this translates into impact assessments that explicitly consider vulnerable learners and safeguards in procurement and classroom deployment.

There is also movement on general-purpose models that underpin many education tools. The European Commission issued a voluntary Code of Practice for GPAI and published guidelines clarifying obligations for GPAI providers ahead of their entry into application on 2 August 2025. These instruments seek to make transparency, risk assessment, and incident reporting more concrete for model providers whose systems are embedded in ed-tech products. This upstream clarity is consequential for downstream education buyers and regulators.

Despite rapid activity, evidence gaps remain. The OECD notes that policymakers still lack reliable information on what AI can and cannot do, complicating curriculum, assessment design, and policy calibration. Development finance institutions likewise caution that universities and ministries face institutional-capacity challenges when integrating new tools at a pace. This reinforces the need for iterative pilots with embedded evaluation and for research partnerships that can inform policy revision cycles.

International AI in education policy is coalescing around a rights-based, risk-based core, with enforceable horizontal regulation (EU/CoE) increasingly complemented by sector-specific guidance (UNESCO/OECD/UNICEF) and by management and risk-standards that operationalize day-to-day practice. Education-relevant provisions mapped to core policy dimensions are presented in Table 3.

4. Discussion

This analysis indicates that IOs have converged on a layered governance model for AI in education that blends rights-based principles, risk-based regulation, and operational standards. A key strategic gain of this layering is that it can reconcile the breadth of education use cases with the need for verifiable safeguards. Soft law instruments articulate values and good practice, while binding law (notably in Europe) establishes enforceable duties and bans. Standards then provide routines for implementation and audit. Contemporary governance scholarship supports this division of labour and cautions that the value of such regimes turns on how well high-level principles are translated into sector-specific controls and monitoring. In particular, the analyses of generative AI governance emphasize the importance of concrete mechanisms to avoid ethics "thinness" and enforcement gaps, an observation directly relevant to education systems adopting general-purpose AI and assessment tools [12].

The EU's prohibition of emotion-inference in educational settings aligns with longstanding concerns in the psychological science literature about the validity of inferring internal emotional states from facial movements alone. The paper [13] argues that context, culture, and individual variation undermine simple mappings from face to emotion. Newer studies underline how easily "authentic" expressions can be simulated or misread [14]. In an education context, where high-stakes decisions about behaviour or performance may be at issue, this body of evidence provides a clear rationale for bright-line restrictions. The policy reduces the risk of spurious inferences and unequal error burdens across student groups.

Other strands of affective computing research continue to report technical progress in classroom-facing emotion recognition systems, including multimodal and real-time approaches [15]. The coexistence of methodological advances with validity critiques reinforces a core policy point. Improvements in accuracy on benchmark datasets do not resolve questions about construct validity, contextual bias, or proportionality in schools [16]. For education authorities, if allowed, the prudent course of action is to treat such systems as research pilots with strict oversight rather than as routine instruments for assessment or discipline.

Concerns about automated proctoring further illustrate why risk-based controls matter in education. Studies document privacy anxieties, contested consent, and perceived intrusiveness, and have synthesized evidence of potential disparate impacts and opacity in commercial tools [17, 18]. These findings support regulatory requirements for risk assessment, documentation, human oversight, and post-market monitoring when institutions procure or operate proctoring systems. This implies shifting from ad hoc adoption to documented justifications, limited use cases, and alternatives that reduce surveillance while protecting assessment integrity.

Across the corpus, current research converges on a central pedagogical message: generative AI weakens the reliability of many take-home text assignments as measures of individual learning, making assessment redesign, not detection-only strategies, the sustainable response [19]. Systematic reviews and empirical studies report mixed or adverse effects on perceived integrity and authenticity when traditional formats persist, and they recommend redesigned tasks coupled with more explicit integrity norms [20, 21]. This evidence supports the direction of recent IO guidance but pushes further by prioritizing robust validity arguments for new assessment formats and rigorous evaluation of their fairness and workload effects.

Teacher capacity and AI literacy emerge as binding constraints on responsible adoption. Recent studies show that many teachers and pre-service teachers lack a confident conceptual and ethical understanding of AI systems, that literacy frameworks are uneven, and that professional development often underestimates the pedagogical redesign required [22-23]. Where law creates explicit literacy duties for deployers and providers, these findings imply a shift from optional training to documented programmes with demonstrable competencies and equity safeguards [24].

Standards can help bridge policy to practice, but are not a substitute for pedagogy or context-sensitive safeguards. ISO/IEC 42001 analyses suggest that management system approaches can improve documentation, risk routines, and accountability, which is helpful for ministries,

universities, and vendors preparing for audits [25]. However, a standards-first approach can invite "compliance minimalism" if not paired with education-specific indicators (learning, equity, wellbeing) and external evaluation. The emerging European work on harmonised standards offers a path to consistent technical expectations [26]. However, education authorities must add sector-specific criteria and evidence-based plans to make classroom expectations meaningful.

Equity and children's rights provide an additional lens for interpreting the international landscape. Studies in K-12 and child-centred design communities emphasise participation, non-discrimination, and the risks of transferring adult-centric models into child contexts [27, 28]. This literature supports IO calls to operationalize children's rights in procurement and classroom use, to involve children and families in design and evaluation, and to guard against systems that shift error or surveillance burdens onto already disadvantaged learners. Practically, equity-aware impact assessment and participatory evaluation should be routine for any AI affecting placement, grading, or behavioural decisions.

A limitation across peer-reviewed syntheses is the scarcity of rigorous, education-specific indicators for monitoring AI's effects at scale. Reviews repeatedly call for multi-level evaluation designs, better causal inference about learning outcomes, and systematic reporting of harms and benefits across subgroups [29]. This strengthens the case for IOs and standards bodies to go beyond principles by convening consensus indicator sets and reference evaluation protocols, with explicit attention to validity, reliability, workload, accessibility, and student wellbeing.

Because many educational uses of AI are embedded in general-purpose systems, governance that treats models, applications, and institutional practices as a system will travel better across contexts. Governance scholars argue that such systems approaches raise the odds that principles and rules will translate into safer, more equitable practice. For IOs, this means linking rights, risk management, and standards to concrete pedagogical and institutional routines, and supporting member states to build evaluation and compliance capacity.

5. Conclusions

This paper shows that international AI in education governance is crystallizing into a layered model: sectoral guidance from UNESCO, comparative evidence from the OECD, a child-rights baseline from UNICEF, a binding human-rights treaty from the CoE, a risk-based regulatory regime from the EU AI Act, and operational scaffolding through international and European standards. These instruments align around human-centred and rights-respecting use while introducing concrete controls for high-risk education applications and routes to implementation via standards.

Scientifically, the paper contributes a cross-organization mapping of approaches, which links normative principles to enforceable rules and auditable practices, and which clarifies how "soft law" and "hard law" interact in education settings. It also documents the emerging role of harmonized standards as a mechanism for translating legal duties into verifiable controls.

Practically, the synthesis offers a near-term action framework for ministries, school systems, and universities: identify and register high-risk education uses under the AI Act; adopt ISO/IEC 42001 and 23894 processes to prepare documentation, oversight, and risk management; and embed child-rights and equity safeguards in procurement and classroom practice, consistent with UNESCO and UNICEF guidance.

Future research should develop and test shared indicators for learning, equity, and wellbeing to enable longitudinal monitoring of AI's impacts; study how general-purpose models and forthcoming harmonized standards affect education procurement and assurance; and track uptake and domestication of the CoE convention across diverse legal systems, including implications for schools and higher education. Comparative, multi-country designs aligned with OECD monitoring and UNESCO sectoral priorities would help build cumulative, policy-relevant evidence.

Declaration on Generative AI

During the preparation of this work, the authors used GPT-5 Instant and Grammarly Edu in order to: grammar and spelling check, text polishing. After using these services, the authors reviewed and edited the content as needed and take(s) full responsibility for the publication's content.

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Table 3
Education-relevant provisions mapped to core policy dimensions

Dimension	UNESCO	OECD	UNICEF	CoE	EU (AI Act)	World Bank	Standards (ISO/IEC; CEN-CENELEC)
Objectives & values	Human-centred; equity, inclusion, linguistic diversity; teacher capacity	Trustworthy use, evidence-informed governance; system readiness	Child-rights lens across AI lifecycle	Rights-respecting AI (HR, democracy, rule of law)	Fundamental-rights protection via risk-based regime	People-centred adoption; readiness & equity	Governance & risk principles to operationalise values
Risk taxonomy / bans	Risk/safeguards guidance (non-binding)	Maps national measures; highlights gaps	Flags risks to children (profiling, bias)	Treaty-level safeguards & redress	Bans: emotion inference in education; biometric scraping; sensitive biometric categorisation	Notes risks and mitigation in deployments	ISO/IEC 23894 guidance for identifying, analysing, treating, and monitoring AI risks
Transparency & accountability	Disclosure of AI use in learning/assessment; institutional policies	Governance of data and assessment use	Transparency to children & guardians	Transparency and accountability guarantees	Transparency duties incl. GPAI disclosures; deepfake labelling; documentation & logging for high-risk	Encourage clear roles, documentation	ISO/IEC 42001 management-system controls; EU "presumption of conformity" via harmonised standards
Data governance & child rights	Privacy, data minimisation, safeguarding students	Data governance for trust	Nine requirements for child-centred AI	Treaty anchors to HR law	GDPR-aligned safeguards	Emphasises privacy and responsible data use	Risk/governance processes and auditor readiness (42001/23894)

Assessment & academic integrity	Redesign assessment; avoid “detect-only” reliance	Validity/ reliability & governance in digital assessment	Protect children from intrusive practices	Rights-compliant assessment impacts	Integrity via transparency & bans on emotion inference in exams/workplaces	Practical cases and cautions	Controls for model/ system performance, robustness, oversight
Teacher capacity & AI literacy	Immediate actions + capacity building	Teacher PD and workload relief as policy priority	Guidance for child-facing contexts implies educator training	Public authority obligations imply training	Article 4: AI-literacy duty for providers & deployers (applies since Feb 2, 2025)	PD & institutional capability as enablers	42001 requires competence, roles, and continual improvement
Procurement, assurance & conformity	High-level policy steps and checklists	Options for governance and procurement	Child-rights criteria for procurement	Oversight & remedies	Conformity assessment, registration for high-risk	Procurement guidance & readiness framing	Auditable management systems (42001); risk controls (23894)
Monitoring & evaluation	Calls for institutional & system evaluation	Need for indicators & monitoring of digital/GenAI	Monitor child impacts	Treaty monitoring mechanisms	Post-market monitoring & incident reporting (high-risk & GPAI systemic risk)	Emphasises evaluation in pilots & scale-ups	Continuous improvement & monitoring required under 42001
Implementation supports	“Immediate actions” + long-term policy roadmap	Cross-country exemplars, guidance	Practical toolkits for child-centred AI	Legal baseline for national translation	Phased timeline (2025–2027); AI Office & standards work	Briefs, use cases, LMIC perspectives	Standards, certification ecosystem