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Responsible AI-Supported Inclusive Learning in Cameroon: A Human-Centred Framework for Educator Development and School Implementation

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Abstract: *Artificial intelligence (AI) may reduce educational barriers through captioning, speech and text conversion, alternative representations, adaptive scaffolding, communication support, and assisted content design. These capabilities do not become inclusive merely because a tool is labelled intelligent or accessible. Their educational value depends on barrier-responsive curriculum design, educator competence, enabling school conditions, local language performance, learner agency, and rights-based governance. This conceptual and policy article develops a human-centred framework for responsible AI-supported inclusive learning in Cameroon. It integrates international rights and policy guidance, Universal Design for Learning, technological pedagogical content knowledge, educator AI-readiness research, recent reviews of AI and disability, and scholarship on inclusive education in Cameroon. The synthesis distinguishes AI, generative AI, adaptive systems, and conventional assistive technologies; maps illustrative affordances to risks and required human controls; and proposes four interdependent implementation domains: barrier-responsive design, educator professional capacity, enabling school conditions, and rights-based governance. A six-domain professional-learning framework and a staged school implementation roadmap translate the conceptual model into operational guidance. The article argues that Cameroon should begin with bounded, accessibility-relevant use cases; co-design with learners with disabilities and educators; test tools under local linguistic and infrastructural conditions; protect sensitive data; and scale only after evidence of feasibility, accessibility, educational validity, and equitable benefit. The framework is a proposition for disciplined implementation and evaluation, not evidence that AI has already improved learner outcomes.*

Keywords: artificial intelligence, inclusive education, disability, educator development, Universal Design for Learning, responsible innovation, Cameroon

NTRODUCTION

Inclusive education is a rights-based obligation to ensure that every learner can access, participate in, and benefit from quality education. It is not achieved simply by placing learners with disabilities in

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ordinary classrooms. Schools must identify and remove barriers embedded in curriculum, communication, assessment, physical environments, expectations, and institutional routines. Article 24 of the Convention on the Rights of Persons with Disabilities establishes the right to an inclusive education system at all levels, while Sustainable Development Goal 4 links inclusion to equitable quality and lifelong learning (United Nations, 2006, 2015). Ainscow (2020) consequently describes inclusion as a continuing process of strengthening schools and education systems so that they can respond to learner diversity.

Digital technology can contribute to that process, but it can also create new forms of exclusion. Captioning may expand access for a deaf learner yet fail when speech recognition performs poorly with local accents or specialised vocabulary. Text simplification may support comprehension yet remove disciplinary meaning. Predictive writing may widen opportunities for expression yet undermine the validity of an assessment if the educational purpose is not clearly defined. A platform may offer sophisticated functions while remaining unusable because of inaccessible interfaces, unaffordable connectivity, weak device access, or unsafe data practices. UNESCO (2023) therefore cautions against treating technology as an educational end in itself and calls for decisions to be judged in relation to relevance, equity, scalability, and sustainability. The disability-focused advocacy brief similarly insists that learners with disabilities and teachers should remain central to technology selection and implementation (Global Education Monitoring Report Team, 2024).

Artificial intelligence intensifies both the promise and the risk. AI-supported systems can convert speech and text, generate alternative explanations, assist with image descriptions, adapt practice sequences, support communication, and help teachers draft accessible learning materials. Recent reviews identify promising applications for participation, differentiation, and access for learners with sensory, communication, learning, and mobility-related disabilities (El Morr et al., 2024; Li et al., 2025; Melo-López et al., 2025; Pagliara et al., 2024). The same literature also identifies bias, privacy, opacity, unreliable output, unequal access, and inadequate educator preparation. Evidence is frequently exploratory, concentrated outside low-resource school systems, or focused on technical capability rather than sustained classroom use and learner outcomes. The important question is therefore not whether AI has inclusive affordances in principle, but under which educational, organisational, and ethical conditions those affordances can reduce barriers in practice.

Cameroon provides a consequential context for this question. The 2023-2030 Education and Training Sector Strategy places equity, inclusion, quality, and system transformation within the national development agenda (Republic of Cameroon, 2023). Yet studies of inclusive education in Cameroon describe persistent gaps in teacher preparation, instructional adjustment, organisational support, and policy implementation. Teachers in a pilot inclusive secondary programme recognised benefits while many remained unsure of their capacity to teach learners with disabilities (Mngo & Mngo, 2018). Learners with hearing impairment reported inadequate adjustments in regular secondary schools (Ndongwa Bamu et al., 2017), and more recent qualitative research identifies policy ambiguity, competence, organisational conditions, and societal attitudes as continuing challenges (Tah, 2025). AI cannot compensate for the absence of these foundations; poorly governed adoption could magnify them.

This article responds by reframing AI-supported inclusion as a human-centred school implementation problem. It is a conceptual and policy analysis and does not report findings from a primary survey. Its purpose is to integrate the strongest components of inclusive education, UDL, TPACK, educator AI readiness, disability-responsive practice, and governance into a coherent framework suited to Cameroon and comparable low-resource settings. Three questions organise the analysis:

1. How should AI-supported inclusive learning be distinguished from generative AI, adaptive systems, and conventional assistive technology?
2. Which educator capabilities, school conditions, and governance safeguards are necessary for responsible implementation?
3. How can schools and policy actors move from bounded pilots to evidence-informed scaling without overstating benefits or weakening learner rights?

The article contributes a precise terminology, an affordance-risk-control matrix, a non-causal implementation architecture, a six-domain educator-development framework, and a staged school roadmap. These outputs are intended to guide professional learning, pilot design, procurement, monitoring, and future research. They should be tested and adapted with learners with disabilities, educators, families, specialists, and school leaders before wider institutional adoption.

Conceptual Approach and Scope

Article type and evidence base

The article uses a critical integrative synthesis. This approach is appropriate when the objective is to connect several bodies of knowledge, clarify concepts, identify tensions, and develop a framework for policy and practice rather than estimate an intervention effect. The evidence base includes international rights instruments and policy guidance; UDL and TPACK scholarship; educator AI-readiness research; recent systematic and scoping reviews of AI, assistive technology, disability, and inclusive education; studies of professional learning and trust; and peer-reviewed research on inclusive education in Cameroon. Sources published between 2006 and 2026 were retained when they contributed directly to at least one of four analytical domains: barrier-responsive design, educator capacity, enabling conditions, or rights-based governance.

The synthesis is purposive rather than systematic. It does not claim exhaustive database coverage, calculate pooled effects, or assign formal risk-of-bias scores. Review articles were used to characterise the breadth and limitations of the emerging evidence; normative sources were used to establish rights and policy principles; empirical studies were used to illustrate educator, institutional, and contextual conditions; and Cameroon-specific sources were prioritised when interpreting local implementation. This transparent boundary prevents the framework from being presented as a tested causal model.

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Analytical integration

The analysis proceeded through four conceptual operations. First, technologies were distinguished by function rather than by marketing label. Second, reported affordances were mapped to the barrier they may address, the educational decision they affect, the risk they create, and the human control required. Third, UDL, TPACK, AI readiness, and human-centred governance were compared to identify complementary contributions and omissions. Fourth, the resulting concepts were translated into professional-learning domains, school implementation phases, and research requirements. Convergence across sources was treated as support for a design proposition; disagreement or limited evidence was retained as an uncertainty to be tested locally.

No human participants, unpublished datasets, or individual-level records were analysed. Accordingly, the article makes no claims about educators' current readiness, the effectiveness of particular tools, or learner outcomes in Cameroon. Statements about possible benefits are framed as affordances or hypotheses. Operational recommendations are derived from the literature and conceptual synthesis, not from unverified survey statistics.

Defining AI-Supported Inclusive Learning

Inclusive education as barrier removal

A useful definition must begin with inclusion rather than with AI. Disability-related exclusion is produced through interactions among the learner, task, curriculum, communication environment, technology, assessment rules, and institutional expectations. A rights-based approach therefore asks which barrier restricts participation, which change is educationally justified, and how the learner's dignity, agency, and entitlement to rigorous learning will be protected. The unit of design is the socio-technical arrangement, not the software alone.

This orientation avoids two common errors. The first is technological solutionism: assuming that a tool can repair structural deficiencies in teacher preparation, curriculum accessibility, specialist support, or school leadership. The second is a narrow medical model: assigning technology to correct an individual learner without examining barriers created by the educational environment. El Morr et al. (2024) warn that AI-and-disability research can reproduce ableist assumptions when disability is reduced to impairment. Responsible implementation instead combines learner consultation, accessible alternatives, high expectations, and a clear account of the educational purpose served by the tool.

Distinguishing adjacent technologies

Several examples commonly described as AI-supported inclusion may also be implemented through conventional assistive technology. Text-to-speech, magnification, switch access, communication boards, and recorded audio are not inherently AI. A feature becomes AI-supported when it depends substantially on computational inference, pattern recognition, prediction, or generation. This distinction matters for procurement, evidence, professional learning, and governance because AI-

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specific risks such as probabilistic error, model bias, opaque inference, and data-intensive processing do not apply equally to every digital support.

Table 1. Working distinctions for responsible school decision-making

Term	Defining feature	Implication for inclusive education
Assistive technology	A device, service, or feature that improves functional access or participation; it may be digital or non-digital and may not use AI.	Judge it by accessibility, fit with the learner and task, reliability, availability, and support requirements.
Artificial intelligence	A computational system that infers, predicts, classifies, recommends, or generates outputs from data.	Verify outputs and consider bias, opacity, privacy, data provenance, and the possibility of error.
Generative AI	A subset of AI that produces new text, images, audio, code, or other content in response to prompts or context.	Protect authorship, assessment validity, factual accuracy, privacy, accessibility, and learner agency.
Adaptive system	A system that changes sequence, level, feedback, pacing, or representation using learner or task data; adaptation may or may not be AI-driven.	Make adaptation goals visible, monitor inappropriate pathways, and retain teacher and learner control.
AI-supported inclusive learning	A planned educational arrangement in which an AI-enabled function is used to reduce a specified barrier while preserving curriculum goals, rights, and meaningful participation.	Require a documented barrier, learning goal, human oversight, accessible alternative, and evidence of benefit and harm.

Note. The defining question is functional: what inference or generation occurs, which barrier is addressed, and what human judgement remains necessary?

Affordances, risks, and human controls

AI-supported tools can broaden access to information and options for expression. Speech recognition and transcription may support learners who experience motor, writing, or note-taking barriers. Text-to-speech and optical character recognition may improve access for learners with visual impairment, dyslexia, or other reading difficulties. Captioning may support deaf and hard-of-hearing learners. Predictive writing, symbol-supported communication, and language-generation tools may widen opportunities for expression. Adaptive systems may vary pacing, feedback, sequence, or representation. Generative systems may help teachers draft alternative examples, summaries, image descriptions, or scaffolded materials. Reviews of assistive technology and AI in inclusive education support this potential while consistently identifying educator preparation, access, evidence quality, and ethical safeguards as unresolved conditions (Fernández-Batanero et al., 2022; Li et al., 2025; Melo-López et al., 2025; Pagliara et al., 2024).

Affordance is not outcome. The same function can be enabling, irrelevant, or harmful depending on the learner, task, language, setting, and method of use. Table 2 therefore pairs illustrative functions with the principal educational benefit, foreseeable failure, and minimum human control. The matrix is a decision aid, not an approved-products list.

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Table 2. Illustrative AI affordances, risks, and minimum human controls

Barrier or task	AI-supported function	Possible educational benefit	Key risk and minimum human control
Access to spoken information	Automated captioning or transcription	Provides a simultaneous textual channel and a record for review.	Accent, noise, and subject vocabulary can produce errors; test locally, correct critical content, and provide a reliable alternative.
Access to print or complex text	OCR, text-to-speech, summarisation, or reformatting	Converts format, supports navigation, or offers an additional representation.	Recognition and simplification may alter meaning; verify against the source and preserve the full accessible text.
Written or spoken expression	Speech-to-text, predictive writing, or communication support	Expands options for composing, communicating, and participating.	The system may misrepresent intent or substitute for the assessed skill; agree the purpose, retain learner control, and document permitted support.
Practice and feedback	Adaptive sequencing, hints, or generated practice	Adjusts pace and provides additional opportunities for guided practice.	A learner may be routed to inappropriate or low-expectation content; keep curriculum goals visible and monitor patterns and progress.
Teacher preparation	Generation of examples, explanations, questions, image descriptions, or draft alternatives	Reduces preparation time and increases the range of accessible materials considered.	Outputs may be inaccurate, biased, inaccessible, or culturally unsuitable; teachers must verify, edit, and align every resource before use.
Translation and language access	Speech or text translation and multilingual generation	Offers provisional support across languages and for family communication.	Local varieties, code-switching, and technical vocabulary may be poorly handled; use bilingual review and avoid high-stakes reliance.

Note. AI should not independently determine diagnosis, placement, grading, disciplinary action, or other high-stakes decisions. Qualified human judgement and due process remain essential.

Foundations of a Human-Centred Framework

Universal Design for Learning

Universal Design for Learning provides the barrier-removal and learner-agency logic. UDL begins from predictable variability and encourages multiple means of engagement, representation, and action and expression. CAST's UDL Guidelines 3.0 emphasise agency, belonging, accessible materials, and flexible pathways (CAST, 2024). In Cameroon, Haji (2025) argues that UDL can strengthen secondary-school instructional design by helping educators plan for diverse participation rather than relying exclusively on after-the-fact accommodation.

AI can operationalise elements of UDL by transforming formats, generating preliminary alternatives, and supplying graduated supports. UDL does not, however, legitimate unlimited technological flexibility. Alternative representations must remain accurate and aligned with the learning goal; options for expression must preserve assessment validity; and engagement supports must not become surveillance or manipulation. UDL functions here as a design discipline: identify the barrier, clarify the intended learning, choose the least intrusive effective support, preserve learner choice, and evaluate whether access and participation improve.

TPACK, perceived usefulness, and AI readiness

The TPACK framework explains why operational familiarity is insufficient for classroom integration. Effective use arises from the interaction of technological, pedagogical, and disciplinary knowledge within a specific educational context (Mishra & Koehler, 2006). Inclusive AI use adds knowledge of accessibility, disability-responsive pedagogy, assessment validity, and governance. An educator may know how to operate a tool yet remain unprepared to determine whether an output is accurate, accessible, culturally appropriate, safe, and instructionally justified.

Perceived usefulness can create openness to adoption, but it is an expectation rather than demonstrated competence (Davis, 1989). Research on teachers and AI reinforces this distinction. Wang et al. (2023) conceptualise AI readiness through cognition, ability, vision, and ethics. Yue et al. (2024) show that favourable attitudes toward AI education can coexist with gaps in technological and content knowledge. Ayanwale et al. (2022) connect relevance and confidence to teachers' readiness and intentions in Nigeria. Alqarni (2026) similarly reports interest in generative AI among teachers working with learners with disabilities alongside continuing needs for professional support and responsible-use guidance. Together, these studies support a multidimensional account of readiness rather than a simple measure of willingness.

Professional learning and calibrated trust

Readiness is developed through sustained, situated professional learning. Nazaretsky et al. (2022) demonstrate that explaining how AI makes decisions and how it can complement teachers can improve trust and willingness to use AI-powered educational technology. Kelley and Wenzel (2025) describe professional partnership inquiry as a route to AI literacy and responsible integration in teacher education. UNESCO's AI Competency Framework for Teachers organises development around a human-centred mindset, ethics, AI foundations and applications, AI pedagogy, and AI for professional learning, with progressive stages of competence (Miao & Cukurova, 2024).
The goal is calibrated trust: neither reflexive rejection nor uncritical confidence. Educators should be able to anticipate likely errors, verify outputs, recognise when a non-AI support is preferable, explain tool use to learners, and stop use when risks exceed benefits. Tool demonstrations without classroom cases, disability-responsive design, feedback, and institutional support are unlikely to produce this professional judgement.

Governance, localisation, and institutional capacity

Human-centred governance protects rights and translates ethical principles into school routines. UNESCO guidance for generative AI calls for privacy protection, age-appropriate use, human agency, inclusion, and educational validation (Miao & Holmes, 2023). For learners with disabilities, disability-related information, voice recordings, learning histories, behaviour records, or health-linked data may be particularly sensitive. Data minimisation, informed procedures, access controls, retention limits, procurement conditions, incident reporting, and appeal mechanisms are therefore operational requirements rather than abstract principles.

Localisation is part of both accessibility and validity. Cameroonian English and French varieties, local languages, code-switching, names, subject terminology, and cultural contexts may not be represented

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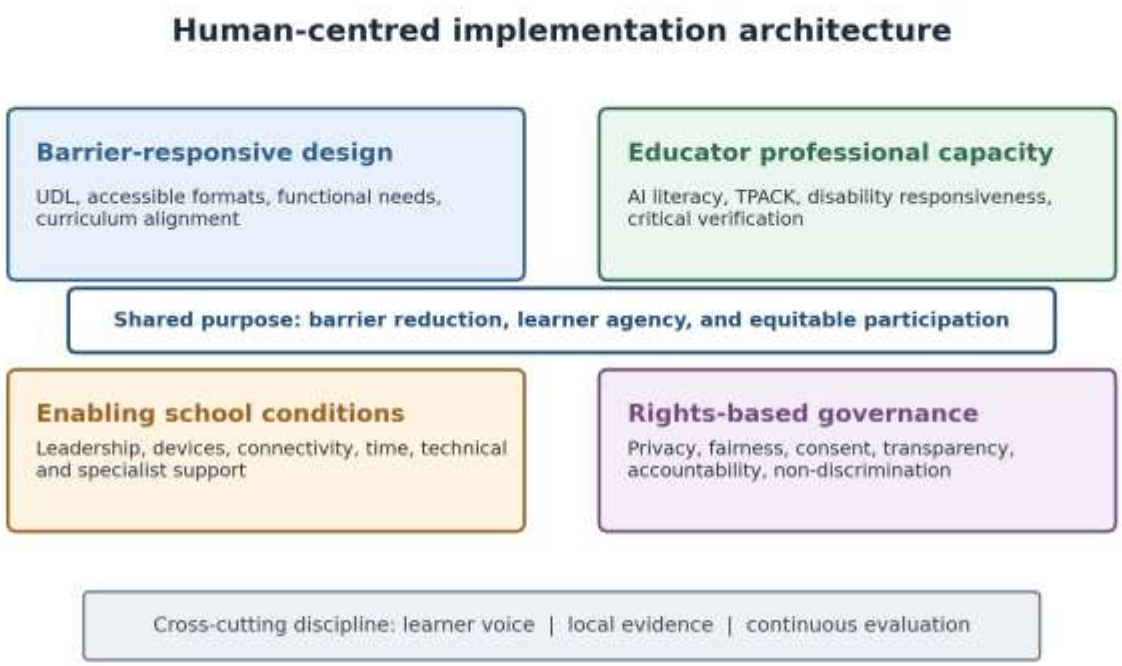
adequately in training data. Fitas (2025) highlights language access as an important dimension of AI-supported inclusive education, while Landa-Blanco (2026) warns that AI may deepen inequality in low- and middle-income countries when infrastructure and local capacity are ignored. A system that performs well in a vendor demonstration may fail under local bandwidth, device, language, class-size, or support conditions.

Human-centred implementation architecture

The synthesis produces four interdependent domains: barrier-responsive design, educator professional capacity, enabling school conditions, and rights-based governance. None is sufficient alone, and no causal ordering is assumed. The domains share one purpose: reducing barriers while protecting learner agency and equitable participation. Learner voice, local evidence, and continuous evaluation cut across all four domains.

Figure 1. Human-centred implementation architecture for AI-supported inclusive learning



Note. The framework is conceptual and untested. It identifies domains that should be considered together; it does not claim that one domain causes another or that implementation produces learner outcomes without empirical evaluation.

Implementation Conditions in Cameroon

Policy and organisational foundations

Cameroon's sector strategy provides a policy basis for linking digital transformation with equity, inclusion, quality, and system strengthening (Republic of Cameroon, 2023). The practical challenge is to ensure that AI initiatives serve these established commitments instead of becoming parallel technology projects. National guidance should define permitted and prohibited uses, minimum accessibility and privacy requirements, procurement responsibilities, evidence thresholds, and roles for teacher-education institutions, school leaders, ICT personnel, inclusive-education specialists, learners, and families.

Inclusive-school research indicates why organisational foundations matter. Mngo and Mngo (2018) found that training and experience were associated with more supportive perceptions in a pilot inclusive programme, while many educators expressed limited confidence. Ndongwa Bamu et al. (2017) showed that ordinary placement did not guarantee appropriate instructional adjustment for learners with hearing impairment. Tah (2025) identifies continuing policy, competence, organisational, and social barriers. These studies do not test AI, but they establish a crucial premise: technology enters a school system with existing strengths and constraints. AI planning should therefore be integrated with teacher development, accessible curriculum, specialist support, leadership, and accountability.

Infrastructure and equity

Connectivity, electricity, device access, maintenance, licensing, account requirements, and technical support vary among schools and within classrooms. These differences can determine who is able to practise with a tool, who receives reliable support, and who bears the cost of failure. A sophisticated cloud service may be less inclusive than a robust offline or low-bandwidth alternative. Procurement should therefore compare total operating requirements rather than headline features and should include maintenance, accessibility support, training, data export, vendor exit, and continuity when subscriptions end.

Equity also requires attention to distribution. Pilots confined to well-resourced urban schools may exaggerate feasibility and hide exclusion. A national learning strategy should deliberately include different language, location, resource, and school-type contexts while avoiding the premature transfer of risk to under-supported schools. Scale should follow evidence that the necessary conditions can be sustained, not merely evidence that a product can function during a demonstration.

Language, culture, and curriculum

Cameroon's bilingual education system and multilingual social environment make language performance an accessibility issue. Captioning, transcription, translation, and generative systems should be tested with intended users, Cameroonian English and French varieties, code-switching, local names, subject-specific vocabulary, and the acoustic realities of classrooms. Generated examples and explanations should be checked against national curriculum expectations and local cultural contexts. Bilingual human review is essential where output influences learning, assessment, family communication, or safety.

Learner voice and the right to alternatives

Learners with disabilities should not be treated only as recipients of solutions selected by adults. They can identify barriers that teachers or vendors overlook, describe when a support is intrusive or stigmatising, and help judge whether a tool improves control and participation. Consultation should be accessible, age-appropriate, and consequential. Schools should also retain a viable non-AI alternative. A learner should not lose access to curriculum because a system fails, a family declines a data-intensive tool, or an account cannot be created.

Educator Development for Responsible Practice

Principles for professional learning

Professional learning should begin with authentic educational problems rather than product menus. Educators first identify the learning goal and barrier, then examine possible supports, including non-AI options. They practise with local cases, compare outputs, inspect errors, adapt lesson and assessment plans, and receive feedback from peers, specialists, and learners. Leaders and coordinators require parallel preparation in procurement, policy, technical support, incident response, and programme evaluation.

Development should be progressive. Foundation work builds concepts of inclusion, AI, uncertainty, and rights. Supervised practice connects tools to curriculum and functional needs. Classroom inquiry tests bounded use cases and documents adaptation. Leadership and peer-learning roles emerge only after educators can demonstrate safe and educationally valid practice. This sequence aligns with UNESCO's progressive competency logic while adding disability responsiveness and school implementation evidence (Miao & Cukurova, 2024).

Six-domain professional-learning framework

Table 3. Professional-learning framework for responsible AI-supported inclusive education

Domain	Core competence	Illustrative evidence of readiness
1. Inclusion and UDL	Identify barriers; clarify learning goals; plan multiple means of engagement, representation, and action and expression; preserve learner agency.	A lesson plan links a specified barrier, goal, support, learner choice, and accessible alternative.
2. AI foundations	Explain common AI functions, probabilistic error, limitations, data dependence, and the need for verification.	The educator accurately explains what a tool can and cannot infer and verifies a representative output.
3. Disability-responsive application	Match AI-supported and non-AI options to functional needs without making diagnostic assumptions.	A case demonstration shows appropriate configuration, consultation, and avoidance of low expectations.
4. Pedagogical integration	Align use with curriculum, instruction, feedback, assessment validity, and learner independence.	A taught activity shows how the support enables rather than replaces the intended learning process.
5. Ethics and governance	Apply privacy, fairness, transparency, consent, data minimisation, accessibility, accountability, and escalation procedures.	A pre-use risk check identifies data flows, possible harm, oversight, alternatives, and incident response.
6. Localisation and evaluation	Test language, connectivity, device fit, reliability, user experience, benefit, and unintended effects under local conditions.	A pilot record documents failures, adaptations, learner feedback, and evidence concerning barrier reduction.

Note. The domains integrate UDL, TPACK, UNESCO's AI Competency Framework for Teachers, disability-responsive practice, and human-centred governance. They are developmental targets, not a validated measurement scale.

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Assessing readiness without reducing it to confidence

Readiness assessment should examine performance as well as self-report. Confidence can be useful, but it may be high before an educator has encountered realistic errors or low despite adequate competence. A balanced assessment can combine scenario-based judgement, lesson-design tasks, output verification, accessibility checks, observed practice, learner feedback, and reflective explanation. Evidence should be linked to a defined use case and stage of responsibility. An educator ready to use captioning in a supervised lesson is not automatically ready to authorise a school-wide generative-AI platform.

Any future readiness instrument should define each construct, publish item wording and response anchors, establish content validity with educators and disability stakeholders, use cognitive interviews across English and French versions, pilot the instrument, and examine dimensionality. Reliability should be reported separately for every multi-item construct using Cronbach's alpha and McDonald's omega, supplemented by item-total evidence. Discriminant validity is especially important where training exposure, digital competence, perceived usefulness, and readiness may overlap conceptually.

Staged School Implementation Roadmap

Responsible implementation is a sequence of governed decisions rather than a single purchase or workshop. The roadmap in Table 4 begins with authority and baseline conditions, moves through a bounded use case and co-designed preparation, tests the arrangement under supervision, and permits scaling only after evidence review. A school may pause, adapt, or stop at any stage.

Table 4. Staged roadmap for school implementation and evidence-informed scaling

Phase	Core actions	Required evidence	Decision gate
0. Authorise and prepare	Name responsible leaders; define permitted uses; map data flows; check accessibility, infrastructure, support, and legal or ethical requirements.	Governance record, baseline conditions, risk assessment, learner-participation plan, and viable non-AI alternative.	Do not proceed if authority, safeguards, accessibility, or support are inadequate.
1. Select a bounded use case	Specify one learner barrier, curriculum goal, user group, AI function, setting, and duration.	Clear problem statement, theory of use, success and harm indicators, and justification against simpler alternatives.	Reject vague deployments such as general AI adoption without a defined educational purpose.
2. Co-design and prepare	Consult learners and educators; test language and accessibility; configure the tool; provide role-specific professional learning.	Usability findings, adapted materials, competence demonstration, consent or information procedures, and incident route.	Revise until intended users can access, understand, and challenge the arrangement.
3. Conduct a supervised pilot	Use the tool with human oversight in a limited setting; log failures, adaptations, workload, access, and learner experience.	Implementation fidelity, reliability, barrier-reduction evidence, adverse events, and comparison with the alternative.	Stop or redesign when harm, exclusion, invalid assessment, or unmanageable burden emerges.

Phase	Core actions	Required evidence	Decision gate
4. Review and decide	Analyse evidence with learners, staff, leaders, and specialists; examine distribution of benefit and cost.	Decision record addressing effectiveness, equity, feasibility, privacy, sustainability, and unresolved uncertainty.	Choose stop, adapt and retest, continue locally, or prepare limited expansion.
5. Scale with monitoring	Expand gradually; maintain professional learning, technical support, procurement controls, audit, feedback, and appeal.	Comparable evidence across settings, monitored incidents, continuing accessibility, and sustainable resources.	Suspend or narrow use if performance, equity, or governance deteriorates.

Note. Scaling is a reversible decision. Procurement volume, account numbers, or workshop attendance are implementation inputs, not evidence of inclusive educational benefit.

Governance and procurement

Procurement contracts should specify data ownership, collection and retention, model or service changes, accessibility commitments, language support, technical assistance, export and deletion procedures, audit rights, incident notification, and exit arrangements. Vendor claims should be treated as hypotheses until independently tested with intended users and local conditions. Schools should avoid entering identifiable disability or health-related information into public AI systems unless a lawful, necessary, and specifically authorised process exists.

Classroom documentation

A concise classroom record can protect educational purpose. The educator documents the intended competency, barrier, selected support, reason an AI function is necessary, learner choice, non-AI alternative, method of output verification, permitted assistance during assessment, and evidence used to judge benefit. This record supports continuity, peer review, valid assessment, and learning from failure. It also makes clear that AI use is accountable to curriculum and inclusion rather than to novelty.

Monitoring indicators

Monitoring should extend beyond numbers of devices, accounts, licences, or trained staff. Educator indicators can examine competence, confidence calibration, workload, and fidelity. Tool indicators can examine uptime, error patterns, language performance, accessibility, latency, and cost. Learner indicators can examine access, participation, autonomy, experience, learning, and unintended dependence. Equity indicators should compare who gains access, who experiences errors, and whether resource disparities widen. Governance indicators should cover incidents, response time, complaints, consent or information processes, data practices, and corrective action.

Research Agenda

Measurement development

Research should begin with construct clarity. AI-supported inclusive learning, perceived usefulness, readiness, training exposure, professional competence, organisational support, and implementation

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fidelity are related but distinct. Instruments should define whether training means participation, duration, frequency, content, quality, or demonstrated learning. Item overlap between training and readiness can inflate associations, while a single global reliability coefficient can conceal multidimensionality. Content validation should involve inclusive-education specialists, AI and measurement experts, teachers, learners with disabilities, and representatives of both language subsystems.

A defensible validation sequence includes cognitive interviews, bilingual translation and reconciliation, pilot testing, item analysis, exploratory and confirmatory factor analysis in adequate samples, construct-specific alpha and omega, convergent and discriminant validity, and examination of measurement invariance across language, educator role, school type, and relevant experience. Instruments and scoring rules should be available as supplementary materials where permissions allow.

Sampling, roles, and school clustering

Future studies should report the sampling frame, participating schools, school types and locations, recruitment, eligibility, response rate, nonresponse, fieldwork dates, and respondent characteristics. Teachers, administrators, ICT coordinators, and inclusive-education personnel may interpret readiness differently; pooling them requires conceptual and empirical justification. Because respondents are nested within schools, ordinary regression may underestimate uncertainty. Depending on the number of schools and study purpose, analysis should use multilevel models, cluster-robust standard errors, or another design-consistent approach.

From perception to implementation and outcomes

Cross-sectional self-report can identify beliefs and hypotheses but cannot demonstrate classroom use or causal impact. A stronger programme of research should combine validated surveys with observation, task-based competence, implementation logs, interviews, learner and family perspectives, system performance, and school records. Longitudinal professional-learning studies can examine change over time; design-based research can refine tools and routines in authentic settings; and quasi-experimental or controlled studies may be appropriate for bounded questions when ethical and feasible.

Learner outcomes should be specified before implementation and should not be inferred from educator perceptions. Relevant outcomes may include access to information, participation, independence, quality of expression, curriculum attainment, assessment validity, wellbeing, and equitable distribution of benefit. Research must also examine unintended consequences: exclusion due to device or account requirements, inaccurate language processing, stigma, surveillance, dependence, reduced expectations, teacher workload, or displacement of proven non-AI supports.

Policy and Practice Recommendations

The conceptual synthesis motivates a coordinated implementation strategy. The recommendations below are derived from the literature and framework; they are not empirical findings about current practice across Cameroon.

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- The Ministry of Secondary Education should establish a national human-centred policy for AI in schools that connects inclusion, curriculum, assessment, safeguarding, data governance, procurement, and professional standards.
- Teacher-education institutions should embed UDL, disability-responsive AI literacy, critical verification, assessment validity, privacy, and school-based inquiry across initial preparation and continuing professional development.
- Pilot programmes should begin with a small number of barrier-specific use cases and include different resource, language, school-type, and location contexts before any claim of scalability.
- Schools should create multidisciplinary implementation teams that include educators, leaders, ICT and inclusive-education personnel, learners with disabilities, families where appropriate, and specialist support.
- Procurement should require evidence of accessibility, local language performance, privacy, interoperability, total cost, technical support, auditability, and a workable exit plan.
- Monitoring should measure competence, accessibility, reliability, learner experience, curricular validity, equity, incidents, and sustainability rather than relying on licences, devices, or attendance counts.
- Research funders and institutions should prioritise bilingual measurement development, participatory design, school-clustered samples, longitudinal implementation evidence, and learner-centred outcomes.

CONCLUSION

Responsible AI-supported inclusive learning begins with an educational right and a barrier, not with a product. The literature indicates that AI-enabled functions may expand access, representation, communication, practice, and teacher design support, while also creating risks of error, bias, opacity, privacy loss, invalid assessment, dependence, and unequal access. It also indicates that teacher preparation, accessible design, leadership, infrastructure, localisation, and governance shape whether technological possibilities can be used responsibly.

The framework proposed here organises those conditions into four interdependent domains: barrier-responsive design, educator professional capacity, enabling school conditions, and rights-based governance. It recommends a six-domain programme of professional learning and a staged, reversible implementation pathway from authorisation and bounded use-case selection to supervised piloting, evidence review, and cautious scaling. These are conceptual and policy propositions; the article does not claim that they have already produced learner outcomes in Cameroon.

For Cameroon, the most credible pathway lies between technological optimism and blanket prohibition. Schools and policy actors should prepare educators to use and question AI, protect learner agency and sensitive data, test tools under local language and infrastructure conditions, preserve non-AI alternatives, and involve learners with disabilities in consequential decisions. AI becomes educationally meaningful only when it is made answerable to inclusion, curriculum, evidence, and human rights.

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