



FIELD RESOURCE | 2026 EXPANDED EDITION

STEM Education Field Toolkit

Twelve practical tools for designing, funding, governing and measuring AI, coding, robotics and STEM education programmes in Ghana and across Africa.

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Use during school visits, programme-design workshops, procurement reviews, partner due diligence and implementation learning sessions.

FIELD-TESTED THINKING | PRACTITIONER TEMPLATES | EVIDENCE ANCHORS

What this manual helps you decide

Move from idea to explicit decisions, owners, evidence and next actions.

1	Field method	Turn observations into decisions, owners, evidence and review dates.
2	School readiness	Diagnose learning, people, access, infrastructure, operations and governance.
3	Programme design	Define capability, progression, dosage, inclusion and operating assumptions.
4	AI and robotics	Apply practical decision matrices for responsible technology use.
5	Partners and evidence	Assess implementers, claims, indicators, costs and sustainability.
6	Action planning	Convert findings into a 90-day plan and a decision record.

Use the manual as a decision cycle

1 OBSERVE	2 DECIDE	3 ASSIGN	4 REVIEW
Start with the ordinary operating condition, not the launch-day exception.	Record the choice, the alternatives rejected and the assumption carrying the most risk.	Name one accountable owner, the supporting actors and the evidence they must produce.	Set a date and define what evidence will trigger continuation, repair, redesign or stop.

A completed template is not evidence of success. Pair every decision with an observable artefact, a named owner and a scheduled review.

Make the decision visible

These tools are designed for facilitated judgement, not box-ticking.

1. Define the learning problem before discussing platforms, kits or events.
2. Observe the operating reality: timetable, class size, power, connectivity, storage, staff and support.
3. Ask for evidence at the same level as the claim. Reach is not capability; capability is not durability.
4. Record every unanswered question as an assumption, action, owner and date.
5. End every session with an explicit decision: proceed, proceed with conditions, redesign, pause or stop.

A programme is ready when its learning promise, delivery model, people, infrastructure, governance, evidence and ownership reinforce one another.

Facilitation rule

Complete each tool with the people who will teach, learn, operate, fund and govern the programme. Differences in perspective are evidence, not inconvenience.

PRACTITIONER DEPTH

DECISION BRIEF	Use the toolkit as a facilitated inquiry. Scores are prompts for evidence and disagreement, not answers. The value appears when participants convert observations into explicit choices, owners, tests and review dates.
EVIDENCE TO LEAVE	Open a decision log before the workshop. Capture evidence cited, assumptions raised, minority views, conditions, actions and the decision that each tool is intended to support.
FIELD CHALLENGE	Invite a teacher, learner, operator and budget owner to challenge the same score. Differences reveal system boundaries that a single perspective misses.

DECISION GATE

ASSUMPTION	EVIDENCE OWNER	NEXT REVIEW	STOP / SCALE RULE
☐ Named	☐ Assigned	☐ Dated	☐ Recorded

School STEM Readiness Heatmap

Score 1 (fragile) to 4 (durable). Record the evidence behind the score before discussing averages.

DIMENSION	1 - FRAGILE	2 - EMERGING	3 - WORKABLE	4 - DURABLE
Purpose	Technology-first idea	Broad aspiration	Defined capability	Capability, curriculum and beneficiary evidence align
Progression	One-off activity	Repeated beginner tasks	Sequenced pathway	Transition standards and destinations are clear
People	External expert only	One champion	Prepared teacher team	Local coaching and succession exist
Access	Self-selection	Attendance counted	Timetabled access	Participation and progression gaps are repaired
Operations	Informal	Named custodian	Runbook and budget	Failures recover through tested routines
Governance	Assumed	Basic policy	Controls and owners	Incidents drive system learning
Evidence	Photos/anecdotes	Reach/feedback	Capability evidence	Transfer, cost and durability inform decisions

Interpretation: any score of 1 in safeguarding, feasibility or people is a design warning. Do not let a high average conceal a critical weak link.

PRACTITIONER DEPTH

DECISION BRIEF	Score each dimension independently and apply red-line rules before averaging. A fragile safeguarding, staffing or feasibility condition can stop a programme even when other dimensions are strong.
EVIDENCE TO LEAVE	For every score, record one observable fact, one source and one limitation. Repeat the heatmap after 90 days to show which conditions changed and why.
FIELD CHALLENGE	Compare leadership scores with teacher and learner scores. Investigate gaps greater than one point before finalising the diagnosis.

DECISION GATE

ASSUMPTION	EVIDENCE OWNER	NEXT REVIEW	STOP / SCALE RULE
☐ Named	☐ Assigned	☐ Dated	☐ Recorded

Evidence and Assumption Register

Separate what is known from what is believed. Assign verification before commitment.

STATEMENT / ASSUMPTION	CURRENT EVIDENCE	CONFIDENCE	TEST	OWNER / DATE
		Low / Med / High		
		Low / Med / High		
		Low / Med / High		
		Low / Med / High		
		Low / Med / High		
		Low / Med / High		
		Low / Med / High		
		Low / Med / High		

Rarely asked, often decisive

Which room is actually available during the school week? Who can approve a timetable change? How long did the last repair take? What happens when the trained teacher transfers? Which learners have never joined a technology activity? Who pays the renewal after the grant?

PRACTITIONER DEPTH

DECISION BRIEF	Write assumptions as testable statements rather than vague concerns. Confidence reflects evidence quality, not team enthusiasm. Prioritise assumptions that are both uncertain and capable of reversing the decision.
EVIDENCE TO LEAVE	Record source, date, confidence, consequence if wrong, verification method, owner and deadline. Close an assumption only when the evidence is linked.
FIELD CHALLENGE	Select the three highest-impact assumptions and design the cheapest ethical test that can reduce uncertainty within 30 days.

DECISION GATE

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Capability Promise Builder

Write an observable promise that can survive a change of vendor, kit or software.

By [time], [learner group] will [observable capability] by producing [authentic evidence] under [relevant constraints].	
Learner group and starting point	_____
Capability verb	_____
Authentic product or performance	_____
Relevant constraints	_____
Transfer task	_____
Curriculum or destination connection	_____

Quality checks

Can a reviewer observe the capability? Does the task reveal reasoning? Could the learner succeed by copying a tutorial? Is the promise feasible at the intended dosage? Would it still matter if the current product disappeared?

PRACTITIONER DEPTH

DECISION BRIEF	A capability promise protects the programme from tool-led drift. It should state who will do what, under which constraints, with what evidence and where the learning transfers next.
EVIDENCE TO LEAVE	Keep a weak first draft, revised decision-grade promise, aligned task, rubric and example of evidence that would fail the standard.
FIELD CHALLENGE	Ask whether a learner could satisfy the promise by copying a tutorial. If yes, add prediction, modification, debugging, explanation or transfer.

DECISION GATE

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Robotics Programme Readiness Checklist

Use before approving a kit purchase, competition pathway or implementation partner.

CHECK	DECISION TEST	EVIDENCE / OWNER
☐	The programme has a precise learner capability and progression statement.	
☐	Projects connect to curriculum and locally meaningful systems or problems.	
☐	A teacher team owns delivery, assessment and basic troubleshooting.	
☐	Equipment quantity matches group size, active roles and timetable dosage.	
☐	Storage, charging, inventory, safe use and repair routines are defined.	
☐	Consumables, spares and replacement are included in recurring cost.	
☐	Learning continues during internet, power or device interruption.	
☐	Roles rotate so every learner builds, codes, tests, debugs and explains.	
☐	Assessment captures design reasoning, iteration and transfer.	
☐	A pilot and end-of-cycle learning review are scheduled.	

Decision: ☐ Ready ☐ Ready with conditions ☐ Redesign ☐ Stop

PRACTITIONER DEPTH

DECISION BRIEF	Use the checklist before procurement and again before launch. A tick requires visible evidence; partial readiness becomes a condition with an owner and date. Do not average away a missing safety or ownership condition.
EVIDENCE TO LEAVE	Attach the progression map, group model, inventory plan, repair route, teacher rehearsal, safety controls, recurring budget and pilot protocol.
FIELD CHALLENGE	Run one session with the expected class size and available kit quantity. Measure active technical time per learner rather than relying on planned ratios.

DECISION GATE

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Physical, Virtual or Blended Decision Matrix

Choose the medium against the learning objective and operating context.

CRITERION	PHYSICAL-FIRST	VIRTUAL-FIRST	BLENDED
Best for	Construction, tools, sensors and material behaviour	Repeated coding, modelling and wide access	Simulation-to-hardware transfer
Access	Limited by kit and room capacity	Can extend across compatible devices	Virtual practice protects scarce hardware time
Failure	Mechanical, electrical and environmental	Logical, conceptual and model-based	Difference between model and reality
Operating need	Storage, spares, charging and support	Devices, updates and offline plan	Both, sequenced around progression
Choose when	Material engineering is central and support is ready	Practice access is the immediate constraint	Scale and physical judgement both matter
Recommended model			
Reason			
Progression between modes			
Condition that would change the choice			

PRACTITIONER DEPTH

DECISION BRIEF	Choose by learning objective and constraint. Virtual environments expand repetition and access; physical systems develop material judgement; blended pathways can protect scarce hardware time when transitions are deliberately taught.
EVIDENCE TO LEAVE	Document the capability assigned to each mode, device and infrastructure assumptions, learner-access implications, transition task, cost and failure fallback.
FIELD CHALLENGE	Ask learners to predict where the virtual model will differ from physical behaviour, then test and explain the discrepancy.

DECISION GATE

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Coding Progression and Transition Planner

Languages and interfaces are tools inside a capability pathway.

STAGE	LEARNERS UNDERSTAND	LEARNERS MAKE	TRANSITION EVIDENCE
Systems/sequence	Instructions, patterns, conditions and repetition	Unplugged models and algorithms	Prediction and explanation
Block-based	Events, loops, variables and debugging	Stories, games and simulations	Modified project and walkthrough
Physical computing	Inputs, decisions, outputs and sensing	Interactive systems	Test record and fault explanation
Text programming	Syntax, functions, data and reuse	Python programs and automations	Debugging and transfer task
Interactive products	Interfaces, users, data and iteration	Web applications and solutions	User evidence and oral defence

Move learners forward when they can predict, debug, modify and explain - not simply because they completed a tutorial.

PRACTITIONER DEPTH

DECISION BRIEF	Progress when learners can predict, debug, modify and explain. Syntax exposure is not a transition standard. Connect each stage to increasingly independent products and authentic users or problems.
EVIDENCE TO LEAVE	Retain representative tasks, code versions, debugging evidence, oral explanations, moderation notes and the transition decision for each learner or cohort.
FIELD CHALLENGE	Give a familiar project with one requirement changed. Learners ready to progress should adapt structure and explain consequences rather than restart from a tutorial.

DECISION GATE

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AI Classroom Use Decision Canvas

Decide the learning purpose, human role, risk, data and evidence before opening a tool.

Learning objective	_____
Why AI adds value	_____
What remains human	_____
Data involved	_____
Risk class and controls	_____
Offline core and fallback	_____
Verification route	_____
Authorship evidence	_____
Teacher approval and review date	_____

Red lines

Do not use unapproved AI for identifiable learner records, safeguarding information, covert monitoring or consequential automated decisions. Ensure a qualified human can explain, challenge and reverse consequential outcomes.

PRACTITIONER DEPTH

DECISION BRIEF	Complete the canvas before opening an AI system. The learning purpose, human responsibility, data boundary, risk class, verification and authorship evidence should determine whether and how the tool is used.
EVIDENCE TO LEAVE	Attach the approved system, data map, risk decision, offline core, verification plan, learner disclosure and teacher review date.
FIELD CHALLENGE	Replace the proposed AI use with a non-AI method. Proceed only if AI adds a clear educational benefit that justifies the additional risk and complexity.

90-Day Teacher Capability Planner

Turn an initial workshop into supported application, evidence and local leadership.

PERIOD	CORE ACTION	EVIDENCE	OWNER / DATE
Weeks 1-2	Diagnosis and applied foundation lab	Baseline task and goal	
Weeks 3-4	Lesson rehearsal and implementation plan	Observed rehearsal and feedback	
Weeks 5-6	First classroom application	Learner artefacts and reflection	
Weeks 7-8	Second application after coaching	Adaptation and comparison	
Weeks 9-10	Evidence review and problem clinic	Priority barrier and action	
Weeks 11-12	Demonstration and next-cycle plan	Capability and leadership role	

Quality test

Can the teacher adapt the next lesson for a different class, explain the decision and show what learners produced - without waiting for the original trainer?

PRACTITIONER DEPTH

DECISION BRIEF	Move from workshop knowledge to classroom capability through rehearsal, application, coaching, evidence review and peer leadership. Protect time for teachers to adapt materials and analyse learner work.
EVIDENCE TO LEAVE	Collect the baseline, rehearsal feedback, two lesson observations, learner artefacts, troubleshooting demonstration, reflection and next-cycle leadership commitment.
FIELD CHALLENGE	At day 90, ask the teacher to support a colleague through an unfamiliar problem. Transfer to peers is stronger evidence than personal confidence.

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Three-Year STEM Total-Cost Planner

Price the learning system, not only the opening-day equipment.

COST AREA	INCLUDE	SETUP	Y1	Y2	Y3	OWNER
Infrastructure	Power, accessibility, security, storage					
Learning tools	Devices, robotics, electronics, fabrication					
Software/data	Licences, hosting, updates, connectivity					
People	Training, coaching, planning and support					
Operations	Scheduling, inventory and administration					
Consumables	Components, batteries and materials					
Maintenance	Repairs, spares, warranty and replacement					
Governance	Safety, privacy, policy and incident response					
Evidence	Baseline, assessment, observation and review					
Contingency	Exchange rate, shipping and delay					

Compare options using complete three-year cost, active learner-hours, assessed capability and sustained sites - not purchase price alone.

PRACTITIONER DEPTH

DECISION BRIEF	Complete the planner with finance, teaching, IT and operations staff. Use low, base and high scenarios for uncertain costs and identify who owns each recurring obligation after external funding.
EVIDENCE TO LEAVE	Attach quotations, quantity assumptions, renewal terms, staff-time basis, failure rates, replacement policy, exchange-rate treatment and contingency rationale.
FIELD CHALLENGE	Calculate the cost if utilisation reaches only half the plan. Decide whether to change the operating model, stage the purchase or reduce fixed commitments.

DECISION GATE

ASSUMPTION	EVIDENCE OWNER	NEXT REVIEW	STOP / SCALE RULE
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Development Partner Programme Scorecard

Score 1 (weak/unverified) to 4 (strong/evidenced/locally owned). Record conditions, not only scores.

DIMENSION	DECISION QUESTION	1-4	EVIDENCE / CONDITION
Relevance	Is the response anchored in a defined learning problem and curriculum?		
Equity	Who joins, participates meaningfully, completes and progresses?		
Learning quality	What can participants make, explain, verify or transfer?		
Teacher capability	Can local educators deliver and adapt with quality?		
Feasibility	Does the model work under ordinary infrastructure and staffing?		
Governance	Are safeguarding, privacy and accountability operational?		
Evidence	Are reach, quality, capability and durability measured?		
Sustainability	Who owns recurring cost and continuation after the pilot?		

Decision: ☐ Fund/proceed ☐ Proceed with conditions ☐ Redesign ☐ Do not proceed

PRACTITIONER DEPTH

DECISION BRIEF	Apply minimum standards before total scores. Local ownership, safeguarding or feasibility may be non-compensable. Score the evidence supporting each claim as well as the programme design itself.
EVIDENCE TO LEAVE	Keep scorer notes, evidence links, conflicts, conditions, minority views, due-diligence questions and the final funding or partnership decision.
FIELD CHALLENGE	Ask the implementer which evidence would prove that its model should not scale. A credible partner can name limits and stop conditions.

DECISION GATE

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STEM Evidence Ladder

Make claims only at the level the evidence supports.

LEVEL	QUESTION	EXAMPLE EVIDENCE	PROGRAMME INDICATOR
1. Reach	Who accessed what dosage?	Unique participants and attendance	
2. Experience	Was delivery feasible and appropriate?	Observation, feedback and logs	
3. Capability	What can participants do and explain?	Authentic tasks and portfolios	
4. Transfer	Is capability used in a new context?	Adaptation and new task	
5. Progression	What do participants do next?	Advanced work and destinations	
6. Durability	What remains after support reduces?	Timetable, budget and local delivery	

Reporting discipline

Define reporting period, participant type, denominator, attendance threshold, duplication method, data source and limitation beside every headline figure.

PRACTITIONER DEPTH

DECISION BRIEF	Climb the ladder only when evidence supports the next claim. Report reach, experience, capability, transfer, progression and durability separately so stakeholders can see both achievement and uncertainty.
EVIDENCE TO LEAVE	Create a claim register linking wording, level, indicator, source, denominator, disaggregation, quality check, limitation and approval owner.
FIELD CHALLENGE	Take the annual report's strongest sentence and identify its evidence level. Rewrite any claim that reaches higher than the supporting data.

DECISION GATE

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Indicator Definition Sheet

An indicator without a definition produces numbers that cannot be compared or defended.

Indicator and purpose	_____
Numerator	_____
Denominator	_____
Unit and disaggregation	_____
Data source	_____
Collection cadence	_____
Quality check	_____
Limitation	_____
Decision triggered	_____

PRACTITIONER DEPTH

DECISION BRIEF	Define indicators before collection. The numerator, denominator, threshold, unit, period, disaggregation and decision use must be unambiguous enough for another team to reproduce the number.
EVIDENCE TO LEAVE	Keep version history, calculation examples, data source, collection responsibility, validation rule, missing-data method, limitation and change-control owner.
FIELD CHALLENGE	Give the definition to two analysts using the same sample data. Different results reveal ambiguity that must be repaired before reporting.

DECISION GATE

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Meaningful Participation Audit

Presence is not participation. Examine access to technical decisions, feedback and progression.

MOMENT	WHO GETS ACCESS?	EVIDENCE	DESIGN RESPONSE
Entry	Who hears, qualifies, applies and is selected?	Disaggregated funnel	
Attendance	Who can reach and remain in the programme?	Attendance and barriers	
Roles	Who builds, codes, tests, explains and leads?	Structured observation	
Feedback	Whose ideas receive attention and revision?	Feedback sample	
Assessment	Does the task allow diverse ways to demonstrate?	Outcome and moderation	
Progression	Who returns, advances and reaches destinations?	Cohort progression	

Avoid the participation trap

A 50:50 attendance ratio can coexist with unequal access to devices, technical roles, teacher attention and leadership. Audit the experience, not only the register.

PRACTITIONER DEPTH

DECISION BRIEF	Audit technical agency, not attendance alone. Observe who touches tools, writes code, proposes ideas, receives feedback, explains decisions and progresses. Patterns may differ by gender, disability, language, confidence or prior access.
EVIDENCE TO LEAVE	Use disaggregated funnel data, timed role observation, learner voice, feedback samples, assessment outcomes and progression records. Document the design response and follow-up date.
FIELD CHALLENGE	Compare the participation register with a ten-minute observation of technical roles. A balanced headcount can conceal concentrated decision-making.

DECISION GATE

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Programme Risk and Recovery Register

Name failure modes while there is still time to design around them.

RISK / TRIGGER	LIKELIHOOD	IMPACT	PREVENTION	RECOVERY	OWNER

Seed risks

Teacher transfer; timetable loss; equipment failure; renewal shock; unsafe online interaction; vendor exit; unequal participation; low active time; evidence inflation; partner handover; delayed procurement; loss of storage or power.

PRACTITIONER DEPTH

DECISION BRIEF	Name triggers and recovery, not only risks. Prioritise by learner harm, learning loss, operational interruption and reversibility. Assign controls to specific owners and test the highest risks through rehearsal.
EVIDENCE TO LEAVE	Record cause, trigger, likelihood, impact, prevention, immediate response, recovery time, owner, escalation and evidence that the control works.
FIELD CHALLENGE	Choose one high-impact risk and simulate it. Update the register using actual response time and points of confusion.

DECISION GATE

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90-Day Programme Action Board

Convert diagnosis into a small number of governable commitments.

PRIORITY CONDITION	ACTION	OWNER	DATE	EVIDENCE OF COMPLETION

Decision record

Decision	_____

Why now	_____

Evidence supporting	_____

Evidence against	_____

Conditions before next gate	_____

Next review date	_____

PRACTITIONER DEPTH

DECISION BRIEF	Limit the board to the few conditions most likely to improve readiness or reduce risk. Every action should produce evidence for a decision, not merely activity. Review blocked actions before adding new ones.
EVIDENCE TO LEAVE	For each commitment record rationale, owner, deadline, dependency, evidence of completion, current status and the gate or decision it informs.
FIELD CHALLENGE	Remove any action that can be marked complete without changing capability, evidence or operating readiness. Replace it with an outcome-based commitment.

DECISION GATE

ASSUMPTION	EVIDENCE OWNER	NEXT REVIEW	STOP / SCALE RULE
[] Named	[] Assigned	[] Dated	[] Recorded

WORKED EXAMPLE

A school moving from event to pathway

Fictional example showing how four toolkit decisions reinforce one another.

OBSERVATION	TOOL	DECISION	EVIDENCE AFTER 90 DAYS
Robotics club meets when external trainer visits	Readiness heatmap	Protect weekly timetable and prepare two teachers	Scheduled sessions and observed local delivery
Learners repeat introductory builds	Progression planner	Add debug, integration and new-context tasks	Portfolio shows increasing challenge
Kits dominate budget	TCO planner	Shift funds to spares, coaching and assessment	Utilisation and repair turnaround improve
Success reported as attendance	Evidence ladder	Add capability and transfer tasks	Claims become narrower and more credible
The toolkit does not produce one universal answer. It makes the logic, trade-offs and evidence visible enough for responsible local judgement.			

PRACTITIONER DEPTH

DECISION BRIEF	The example demonstrates how separate tools reinforce one decision system. Timetable, teacher capability, progression, cost and evidence should be changed together; isolated improvements often move the bottleneck elsewhere.
EVIDENCE TO LEAVE	Build a before-after record using the heatmap, assumption register, capability promise, cost model, evidence ladder and 90-day action board.
FIELD CHALLENGE	Apply the sequence to one real programme. Identify which tool changes the decision most and which missing evidence prevents responsible commitment.

DECISION GATE

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Evidence anchors and further reading

The frameworks translate public guidance and implementation evidence into practical decision tools.

SOURCE	RESOURCE	ADDRESS
Ghana Ministry of Education	Education Strategic Plan 2018-2030 (2018)	https://moe.gov.gh/edge/content/uploads/2019/05/Education-Strategic%20Plan-2018-2030.pdf
NaCCA	Secondary Education Curriculum (2025)	https://nacca.gov.gh/secondary-education-curriculum/
NaCCA	Robotics Curriculum for Secondary Education (2025)	https://nacca.gov.gh/wp-content/uploads/2025/04/ROBOTICS-Curriculum.pdf
UNESCO	AI Competency Framework for Teachers (2024)	https://www.unesco.org/en/articles/ai-competency-framework-teachers
UNESCO	AI Competency Framework for Students (2024)	https://unesdoc.unesco.org/ark:/48223/pf0000391105
UNESCO GEM Report	Technology in education: A tool on whose terms? (2023)	https://gem-report-2023.unesco.org/
UNICEF Innocenti	Digital Learning, Real Classrooms: Implementation Research in Ghana (2025)	https://www.unicef.org/innocenti/reports/digital-learning-real-classrooms
UNICEF	Guidance on AI and Children, version 3.0 (2025)	https://www.unicef.org/innocenti/reports/policy-guidance-ai-children
Ghana Cyber Security Authority	National Child Online Protection Framework (2024)	https://www.csa.gov.gh/resources/National%20COP%20Framework.pdf
African Union	Continental Artificial Intelligence Strategy (2024)	https://au.int/en/documents/20240809/continental-artificial-intelligence-strategy
African Union	Continental Education Strategy for Africa 2026-2035 (2025)	https://static.au.int/en/documents/20250616/continental-education-strategy-africa-2026-2035
World Bank	Devices for Education Knowledge Pack (2025)	https://documents1.worldbank.org/curated/en/099916207092523135/pdf/IDU-88a5de28-77c9-40f7-a841-9d425cdc505d.pdf

Use these sources as starting points. Confirm current law, policy, curriculum and regulator guidance before making consequential institutional decisions. This manual is an implementation aid, not legal, financial or safeguarding advice.

Evidence quality protocol

CHECK	QUESTION	RECORD
Currency	Is the source still current for the decision date, jurisdiction and learner group?	Version, publication date and date checked
Authority	Is it primary guidance, independent research, implementation evidence or vendor material?	Source type and responsible institution
Fit	Do its assumptions match the school, infrastructure, language, staffing and safeguarding context?	Transfer limits and local verification needed
Use	Which decision does this source inform, and what would cause that decision to change?	Decision link, owner and review trigger

Use the field to improve the framework

A practical contribution to stronger AI, coding, robotics and STEM education systems in Ghana and Africa.

The value of a framework is not the elegance of its diagram. It is the quality of the decisions, routines and learning that it makes possible.

About Jonathan Kennedy Sowah

Jonathan is a Ghanaian AI engineer and K-12 STEM systems builder working across robotics, coding, applied artificial intelligence, teacher development and context-aware education technology. His wider portfolio has reached 25,000+ learners, trained 2,500+ educators and engaged 100+ schools. KodeVR has more than 10,000 active learners.

He works with schools, governments, companies and development partners to turn high-visibility technology ambitions into practical learning systems that can operate under real African conditions.

Use this work responsibly

Adapt the tools to the programme, participants, institution and regulatory context. Record assumptions. Seek qualified technical, legal, safeguarding, financial and evaluation review where the decision requires it.

Before commissioning implementation support

QUESTION	A STRONG ANSWER SHOULD NAME
What capability must remain after the engagement?	The learner, teacher and institutional behaviours that should continue without external supervision.
What conditions shape delivery?	The ordinary timetable, infrastructure, language, safeguarding, procurement and maintenance realities.
How will quality be governed?	Decision owners, evidence definitions, review cadence, repair route and stop-or-scale thresholds.
What will the institution inherit?	Reusable learning assets, local capability, documented routines, data rights and an affordable continuity plan.

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