



AI CURRICULUM & COMPETENCY FRAMEWORK FOR TEACHER EDUCATION INSTITUTIONS (TEIS) IN THE EAST AFRICAN COMMUNITY

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Glossary

Adaptive Systems	Learning	Digital platforms that adjust content, pace, or feedback based on a learner’s performance and needs.
AI Literacy		The knowledge, skills and attitudes required to understand how AI works, how it can be used responsibly, and how to critically evaluate its outputs and limitations.
AI Tool		Any software application or digital system that uses AI techniques such as machine learning, natural language processing or predictive analytics to perform tasks.
Algorithm		A set of instructions or rules that a computer system follows to perform a task or solve a problem.
Artificial Intelligence (AI)		Computer systems designed to perform tasks that typically require human intelligence. These tasks may include learning from data, recognizing patterns, understanding language, solving problems, and making decisions.
Bias (Algorithmic Bias)		Systematic and unfair discrimination in AI outputs caused by biased data, flawed design, or embedded assumptions in algorithms.
Competence		Ability to successfully apply a combination of knowledge, skills, values, and attitudes to solve real-life problems and perform tasks effectively.
Data Privacy		The protection of personal information from unauthorized access, misuse, or disclosure.
Domain		A specific, organized area of learning or human development that a student is expected to master.
Educator		A person who facilitates learning by guiding, mentoring and supporting others in the development of knowledge, skills, values and competencies
Explainability		The ability to understand and interpret how an AI system arrives at its outputs or decisions.

Generative AI	AI systems capable of producing new content such as text, images, audio or code based on prompts or input data.
Learner	An individual engaged in a learning process. In this Framework, the term may refer to (i) Student teachers enrolled in teacher education programmes; (ii) Practicing teachers undertaking professional development; (iii) Pupils or students in schools who are taught by trained educators. The meaning depends on the context in which the term is used.
Micro-credential	A certification awarded for demonstrated competence in a specific skill or progression level (Acquire, Deepen, Create).
Teacher Education Institution (TEI)	An institution responsible for preparing and professionally developing teachers.
Teacher educator	A person who facilitates learning by guiding, mentoring and supporting teacher trainees in developing the knowledge, skills, values, and professional competencies required for effective teaching. During programme implementation, the educator may also be referred to as a <i>learner</i> when participating in professional development activities under this Framework.
Trustworthy AI	AI systems that are reliable, safe, fair, transparent, secure and aligned with ethical standards.

1. Introduction

1.1 Brief overview of AI in education

Artificial Intelligence (AI) refers to computer systems that can perform tasks that usually require human thinking. These tasks include recognizing speech, analyzing data, solving problems and making decisions. In education, AI is used to support teaching, learning and school management (Holmes et al., 2019). AI in education is not a new idea or a recent development that appeared overnight. Its roots go back more than sixty years, when researchers first began exploring how computers could support human learning. In the late 1950s and 1960s, early computer scientists started studying whether machines could simulate aspects of human thinking and problem solving. Education quickly became one of the first areas where these ideas were tested, as researchers believed computers could help students learn at their own pace and receive immediate feedback (Suppes, 1966).

In the 1960s, computer-based tutoring systems were developed to guide students through lessons and give immediate feedback. One early example was PLATO, created at the University of Illinois. PLATO provided lessons, practice exercises and even online discussion forums, which was remarkable at that time (Woolley, 1994). In the 1970s and 1980s, “intelligent tutoring systems” were introduced. These systems attempted to model how a student thinks and adjust instruction accordingly (Sleeman & Brown, 1982). While the technology was limited by the computing power of the time, it laid important groundwork. During the 1990s and early 2000s, the growth of the internet changed education. Online learning platforms began to appear, allowing students to access materials from anywhere. AI tools during this period were mainly used for adaptive quizzes, automated grading and recommendation systems (Brusilovsky & Peylo, 2003). They were not highly advanced, but they improved access and efficiency.

In the 2010s, advances in data processing and machine learning made AI tools more accurate and more widely available. Learning management systems started using AI to track student progress and predict learning gaps. Automated feedback tools helped teachers review assignments more quickly. Speech recognition and translation tools also improved access for students with diverse needs (Luckin et al., 2016). The launch of generative AI tools in the early 2020s marked another major shift. These tools can generate text, images and other content based on user input. In education, they are used to support lesson planning, create practice questions, explain complex topics and provide tutoring support. At the same time, they have raised concerns about academic honesty, data privacy and the changing role of teachers (UNESCO, 2023). Today, AI in education is both a support tool and a topic of study. It can assist teachers with planning, assessment and differentiation. It can also personalize learning experiences for students. However, its use requires careful guidance, ethical standards and professional competence.

1.2 Rationale for AI integration in East African teacher education

As AI reshapes economies, labour markets and transforms the roles of teachers and students, teachers must be equipped with AI literacy and ethical awareness to prepare learners for emerging careers. Integrating AI into teacher education ensures that educators can guide students in responsible use of technology. UNESCO (2024) acknowledges teachers as the primary users of AI in education as well as designers and facilitators of students' learning. They are also recognised as role models for lifelong learning about AI. Yet, many teacher educators are not up to date with the use of AI in teaching and learning nor in role modeling for lifelong learning about AI, an indication that they are unable to be guardians of safe and ethical practice across AI-rich educational environments.

In addition, many teacher education institutions in East Africa face challenges such as large class sizes, limited instructional resources, and uneven access to updated materials, digital capacity gaps. AI can support lesson preparation, assessment design, and access to high-quality digital content, professional development, mentoring, and coaching, thereby strengthening the quality of teacher training. AI can support differentiated instruction, assistive technologies, translation tools, and adaptive learning systems that promote equity and inclusion.

This Regional Curriculum Framework for Artificial Intelligence (AI) provides guidance to teacher educators on integrating AI in teaching, learning and research; and promoting ethical and responsible use of AI.

1.3 Alignment with regional and global frameworks

To ensure global relevance and regional impact, this *Regional Curriculum Framework for Artificial Intelligence (AI)* is aligned with the strategic pillars of leading international and continental frameworks. Specifically it is aligned with the UNESCO AI Competency Framework for Teachers (2024) by adopting its progressive "Acquire, Deepen and Create" levels across the five domains identified. This is further enriched by regional frameworks like the SADC Digital Transformation Strategy (SADC DTS), the African Union (AU) Continental AI Strategy (2024), which emphasizes an "Africa-centric" approach that prioritizes local context, digital sovereignty, and the socio-economic transformation of the continent among others. Whilst this Framework can be adopted/adapted by any higher education institution (HEI), it has specifically been developed for Commonwealth states within the East African Community. It is therefore aligned to the Commonwealth of Learning (COL) values and strategies that emphasize open educational resources (OER) and teacher capacity building in cybersecurity and distance learning. Lastly, the Framework is aligned with the Inter-University Council for East Africa (IUCEA) standards, ensuring therefore, that the curriculum meets regional academic quality assurance benchmarks, fostering cross-border harmonisation and preparing educators to lead the digital renaissance within the East African Community.

1.4 Key Principles

Inclusivity and equity: Teachers should ensure that AI is used inclusively by and for all students, regardless of their gender, ethnicity, abilities or socio-economic or migration status

Centrality of the teacher in teaching and learning: As designers of teaching and learning, teachers should be supported to responsibly use AI in teaching, learning and assessment.

Trustworthiness of AI systems/ Explanability: AI systems used in education must be reliable, safe and accurate; educators and learners should be able to understand how the system works and trust that it uses data responsibly and fairly.

Safety and security of teachers / educators and learners: AI systems in education must protect the physical, emotional and digital safety of educators and learners; including safeguarding personal data, preventing misuse and limiting exposure to harmful or inappropriate content.

Lifelong learning: In the context of the AI revolution, the traditional image of a teacher as a "repository of finished knowledge" has shifted to that of a Lead Learner. Teacher educators and teachers must therefore become lifelong learners for professional development and to navigate the ever-changing world where there is an explosion of knowledge and technological advances influencing teaching and learning.

Contextual relevance: AI should be used in ways that respond to the local educational context, including culture, language, curriculum priorities and available resources. Educators should adapt AI tools and practices to meet the specific needs of their learners and communities rather than applying them in a one-size-fits-all manner.

2. Purpose of the framework

The *Regional Curriculum Framework for Artificial Intelligence (AI)* serves as a strategic guideline for the East African Community (EAC) and the broader continent. By aligning with international bodies like UNESCO, continental visions from the African Union (AU), and regional standards from the IUCEA, the framework:

- Defines regional AI competencies for educators
- Provides a roadmap to governments for national policy on AI for teachers.
- Provides benchmarks for integration of AI in teacher education programmes.
- Provides a clear progression pathway for educators from "AI Awareness" to "Innovative Creation."
- Supports ethical and responsible use of AI

3. Domains and Competencies

This AI Regional Framework covers the following Domains and their associated competencies:

Domain 1: AI foundations and applications:

Competency: This domain should enable educators to evaluate and leverage Artificial Intelligence tools to enhance pedagogical practice and foster student agency.

Domain 2: AI-Enhanced Pedagogy & Assessment

Competency: This domain should enable educators to use AI tools to support teaching, learning and assessment in meaningful and responsible ways.

Domain 3: AI Innovation & Local Solutions

Competency: The educators should be able to design, adapt, and lead the implementation of AI-driven educational solutions that address specific local classroom challenges while preserving cultural context.

Domain 4: Ethical and Responsible AI Practice

Competency: This domain should enable educators to demonstrate the ability to use AI in ways that are safe, fair, transparent and accountable.

Domain 5: Professional Collaboration & Lifelong Learning

Competency: Educators should be able to utilize AI tools to facilitate professional collaboration, curate and create localized Open Educational Resources (OERs), and engage in self-regulated lifelong learning to continuously adapt to the evolving digital landscape in education.

4. Progression Levels

Educators are expected to progress through three levels, “acquire”, “deepen” and “create” as shown below:

4.1 Acquire

At this foundational stage, educators build basic AI literacy that equips them to understand and begin using AI tools in education responsibly. They develop an awareness that AI systems are created and shaped by human decisions, and they learn to recognize both the opportunities and risks of AI in teaching and learning. Educators at this level gain introductory knowledge of how AI works, what it can (and cannot) do, and how to judge whether a tool is suitable and safe for use in their classrooms. They also start to identify ethical concerns such as data privacy, fairness, and inclusion, and explore ways AI can support lesson planning, instruction, assessment and their own professional growth. This stage lays the groundwork for critical, ethical, and effective engagement with AI in educational contexts (UNESCO, 2024).

4.2 Deepen

At the Deepen level, educators demonstrate confident and responsible integration of AI into educational practice, grounded in strong human accountability. They critically assess AI tools for ethical, legal and pedagogical implications, ensuring alignment with policies while protecting data privacy, intellectual property and stakeholder rights. Educators at this stage understand how AI design decisions affect fairness, inclusion, and equity, and they apply AI strategically to enhance student-centred learning, differentiation, engagement and higher-order thinking. They also leverage AI to strengthen their professional development and contribute actively to collaborative learning communities (UNESCO, 2024).

4.3 Create

At the Create level, educators demonstrate advanced, critical engagement with AI, recognizing its broader social implications and their responsibilities as educators and citizens. They contribute to the development of institutional policies and ethical standards for AI in education, advocating for inclusion, equity, social justice and environmental responsibility. Educators at this stage are able to adapt, combine or modify open-source and customizable AI tools to design context-specific solutions that address local educational challenges. They critically evaluate AI's impact on teaching, learning, assessment, and design AI-enhanced, student-centred learning experiences that promote interdisciplinary thinking, problem-solving and innovation. Teachers also use AI strategically to drive their own continuous and transformative professional development while supporting the growth of their professional communities (UNESCO, 2024).

4.4 Mapping Domain Competency to Progression Levels

To ensure clear implementation processes, the domain competencies are mapped into the three levels illustrating the knowledge, skills, and dispositions required at different stages. This ensures that learning outcomes are scaffolded systematically, enabling learners or educators to move from foundational understanding to advanced, applied expertise. Such alignment supports data-informed decision-making, personalised learning pathways, and continuous improvement.

Table 1: Mapping domains to progression levels

	Levels of progression		
Domain	Acquire	Deepen	Create
AI foundations and applications	Explains basic AI concepts	Evaluates different AI tools for specific tasks	Develops subject specific AI use cases

AI-Enhanced Pedagogy & Assessment	Uses AI to generate lesson ideas, examples and practice questions	Designs lessons and assessments that integrates AI	Creates AI literacy activities for students and designs authentic assessments
AI Innovation & Local Solutions	Identifies problems in local contexts that AI might help to address	Pilots AI tools to solve specific challenges	Designs scalable AI solutions tailored to local challenges
Ethical and Responsible AI Practice	Understands key ethical issues i.e. bias, fairness, transparency and privacy	Evaluates AI tools for ethical risk before adoption	Develops frameworks for responsible AI implementation
Professional Collaboration & Lifelong Learning	Identifies gaps in current skillset and engages in professional discussion about AI in education	Takes the initiative to stay current with AI in education trends and collaborates with peers to co-design AI integrated lessons	Is a Lead Learner who models lifelong learning; and leads in AI professional development initiatives

5. Teaching and Learning Activities

To support the progressive development of AI competencies, the framework integrates structured, practice-based learning experiences that enable educators to apply knowledge in authentic contexts. There are a variety of methods that can be utilized to facilitate learning of the use of AI in education. Some of these are explained below but the institutions can utilize these and any other methods, but the emphasis is on practical tasks and use of authentic context

5.1 Micro-teaching

Micro-teaching sessions allow teachers to practice integrating AI into short, focused lessons in a low-risk environment. A participant designs a brief lesson (10–20 minutes) that incorporates an AI tool for planning, instruction, differentiation or assessment. They deliver the lesson to peers, receive structured feedback, and reflect on both pedagogical choices and ethical considerations. The focus is on improving instructional clarity, student engagement and responsible AI use.

5.2 AI innovation projects

AI innovation projects provide opportunities for teachers to identify a real educational challenge within their context and design an AI-supported solution. This may include developing AI-assisted lesson resources, assessment strategies, feedback systems or workflow improvements. Participants are expected to evaluate the pedagogical value, ethical implications, feasibility and impact of their proposed solution. Projects conclude with a presentation, prototype or implementation plan grounded in local needs.

5.3 Case studies & reflection tasks

Case studies expose teachers to realistic scenarios involving AI use in education, including ethical dilemmas, classroom integration challenges or policy-related issues. Participants analyze the situation, identify risks and opportunities and propose informed responses aligned with responsible AI principles. Reflection tasks encourage teachers to examine their own assumptions, classroom practices, and professional responsibilities, fostering critical thinking and continuous improvement in AI integration.

6. Assessment & Certification

6.1 Competency portfolios

Educators compile evidence demonstrating mastery of specific competencies (e.g., lesson plans, student work samples, reflection journals, assessment tools, videos of teaching). Each artifact is mapped to clearly define competency standards or progression levels. Assessment will require a rubric to evaluate the level of progression.

6.2 Peer-reviewed lesson plans

Educators design lesson plans aligned to specific competencies. Peers review the plans using structured rubrics. Feedback is documented and revisions are required before final evaluation. This assessment strategy promotes collaborative learning, encourages critical thinking and improves quality.

6.3 Classroom observation

This requires the use of structured observation tools aligned with competency standards. Observation should be followed by post-observation reflective discussion to strengthen professional learning.

6.4 Micro-credentials (Acquire/Deepen/Create)

Acquire is a foundational Level in which assessment may include quizzes, short reflections, or basic application tasks to track understanding of concepts and frameworks. The second level requires implementation in classroom settings and generation of evidence which may include lesson implementation reports, peer feedback, or classroom observation results. At the level of

creation, assessment may include impact evidence, dissemination (workshops/publications), and reflective analysis.

These tools can be integrated into a coherent assessment ecosystem: a portfolio provides evidence of growth while micro-credentials show progression levels.

7. Implementation Strategy

This AI curriculum Framework can be adapted and packaged as a full course in a programme, topics can be integrated in different courses or mounted as a short course.

The Framework should be disseminated to all member institutions in the region. It is expected that each institution will create awareness among their staff but also build their capacity to use this framework. In summary, implementation strategy can take various forms as listed below:

7.1 Awareness -Integration-Innovation -Scaling Pathway

This represents a staged implementation pathway for adopting AI in education. It starts with one understanding AI concepts and application plus ethics. The second level requires support to educators to apply AI tools in teaching, assessment and other professional tasks. Emphasis should be on guided practice. In the third level, educators are encouraged to design new AI supported pedagogical models relevant to the local context. The last stage is expanding successful AI practices. The use of this model ensures that AI is systematically expanded across institutions, ensuring sustainability and long-term impact

7.2 Institution-based AI learning hubs

Teacher education institutions may set up hubs to support AI capacity development. Such hubs can serve as spaces for training, experimentation, mentorship, and resource sharing. AI Learning Hubs can facilitate professional development workshops, peer collaboration, pilot projects, and research on AI integration in teaching and learning.

7.3 Regional ToT programmes

At the regional level, one of the strategies that can be adopted for implementation is Regional ToT programmes in which selected educators and leaders are trained to become certified trainers in AI integration. These trainers are then expected to cascade knowledge and skills to institutions within their regions. This model promotes local ownership, contextual adaptation, and cost-effective scaling of AI competencies across the education system.

8. Review and Update Mechanism

This Framework is designed as a living document and will be reviewed regularly to remain aligned with emerging developments in AI technologies, educational practices and policy environments. Given the rapid pace of change in AI, continuous refinement is essential to ensure relevance, accuracy and responsible implementation. An annual review process will be conducted to evaluate the effectiveness, clarity and applicability of the competencies and progression levels. The review

will assess new technological advancements, shifts in ethical standards, regulatory updates and feedback from implementation experiences.

The review process will incorporate structured stakeholder input including educators, school/institution leaders, policymakers, technical experts and, where appropriate, student representatives. Feedback will be gathered through consultations, surveys, focus groups or pilot evaluations. Insights from these stakeholders will inform revisions to ensure the Framework remains practical, contextually relevant and responsive to evolving educational needs.

References

- Brusilovsky, P., & Peylo, C. (2003). Adaptive and intelligent web-based educational systems. *International Journal of Artificial Intelligence in Education*, 13, 159–172. <https://sites.pitt.edu/~peterb/papers/AIWBES.pdf>
- Holmes, W., Bialik, M., & Fadel, C. (2019). *Artificial intelligence in education: Promises and implications for teaching and learning*. Boston: Center for Curriculum Redesign. <https://curriculumredesign.org/wp-content/uploads/AIED-Book-Excerpt-CCR.pdf>
- Luckin, R., Holmes, W., Griffiths, M., & Forcier, L. (2016). *Intelligence unleashed: An argument for AI in education*. London: Pearson. <https://www.scirp.org/reference/referencespapers?referenceid=3391328>
- Sleeman, D., & Brown, J. S. (1982). *Intelligent tutoring systems*. New York: Academic Press. <http://geca.area.ge.cnr.it/files/15834.pdf>
- Suppes, P. (1966). The use of computers in education. *Scientific American*, 215(3), 206–220. <https://eric.ed.gov/?id=ED027549>
- UNESCO. (2023). *Guidance for generative AI in education and research*. Paris: UNESCO. <https://unesdoc.unesco.org/ark:/48223/pf0000386693>
- UNESCO. (2024). *AI competency framework for teachers*. UNESCO. <https://unesdoc.unesco.org/ark:/48223/pf0000391104>
- Woolley, D. R. (1994). PLATO: The emergence of online community. Retrieved from University of Illinois archives.