Ng Et Al AI Literacy Framework: Components and Application

- **Training purpose:** understand, teach with, and apply the Ng et al. AI literacy framework
- **Scope:** four dimensions, sub-components, and practical application to lesson design and curriculum review
- **Expected outcomes:** explain the framework, map teaching activities to dimensions, review AI literacy curricula
- **Orientation:** current Chinese policy context (AI + Education Action Plan, teacher AI literacy standards)
- **Terminology:** original English framework terms preserved for scholarly accuracy
- **Audience:** AI education beginners, teacher candidates, teacher trainers, curriculum evaluators

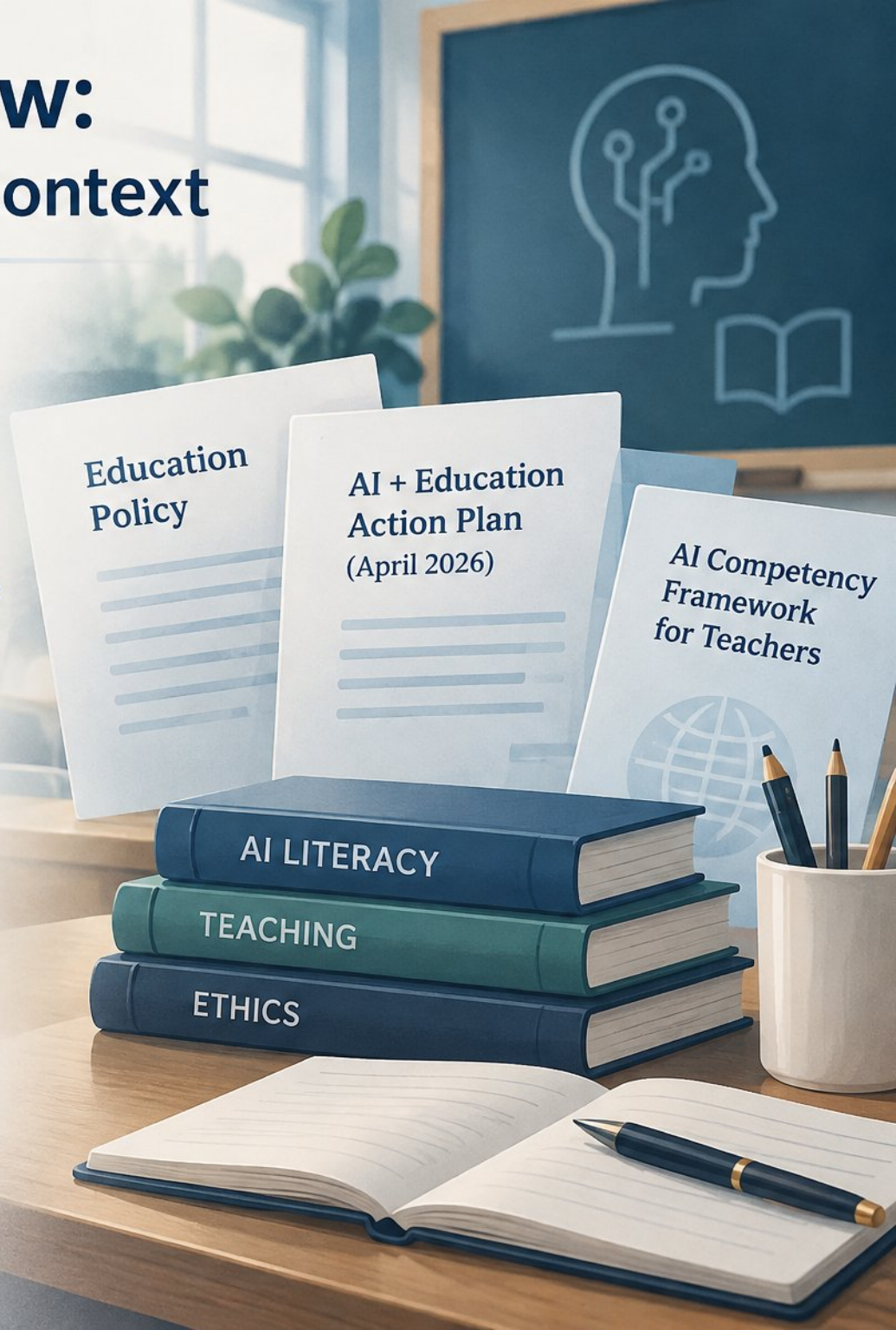


EDUCATION
FOR A BRIGHTER TOMORROW

Why AI Literacy Now:
Background and Policy Context

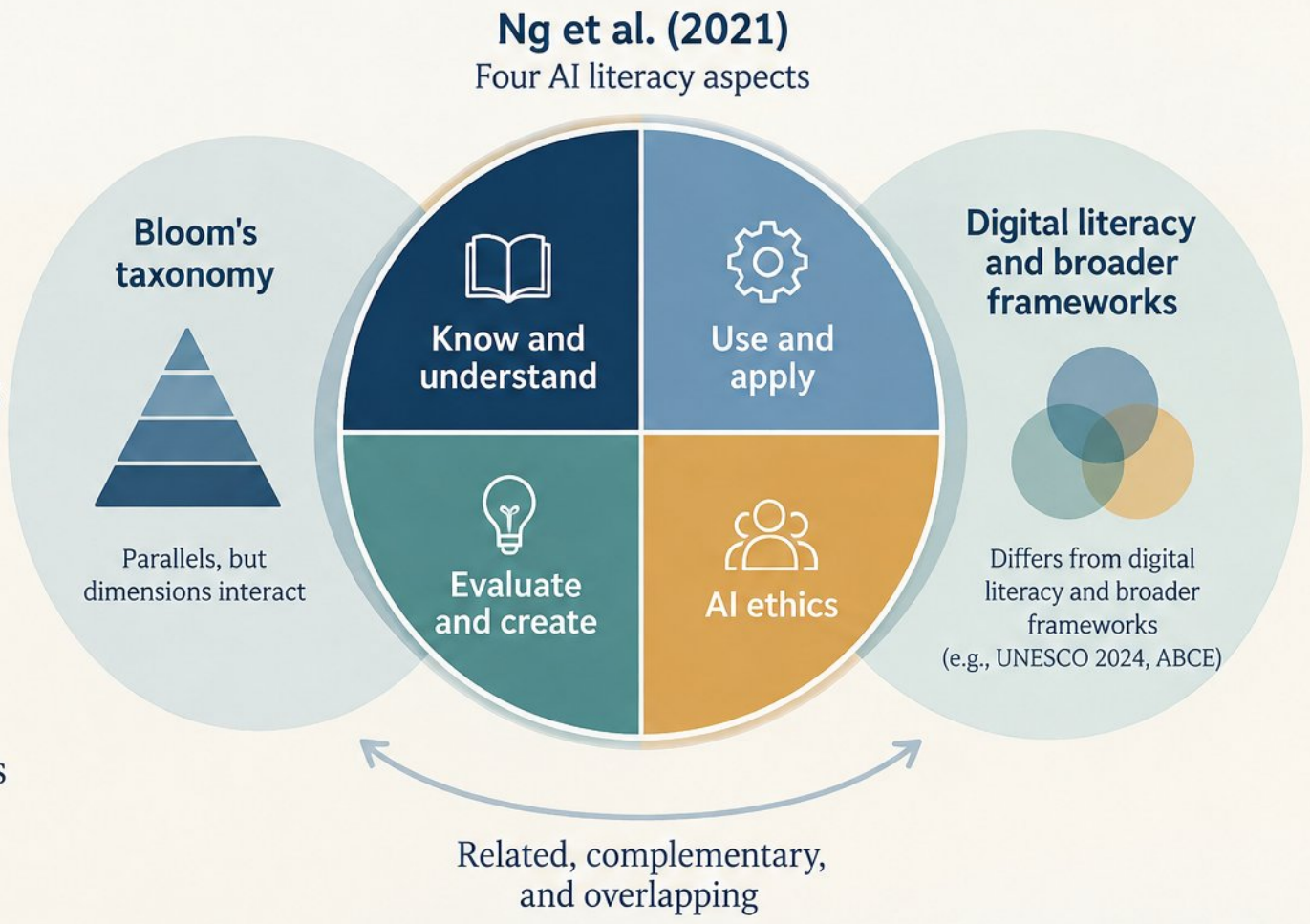
- Generative AI spreads through schools and assessment faster than formal policy
- China's 'AI + Education' Action Plan (April 2026): full-coverage teacher training
- Teacher AI literacy standards, AI knowledge in teacher qualification exams
- International momentum: UNESCO AI Competency Framework for Teachers
- Risk: superficial tool training without conceptual and ethical grounding





Origins of the Framework and How It Relates to Other Models

- Ng et al, (2021): exploratory review of 30 studies proposes four AI literacy aspects
- Four aspects: know and understand, use and apply, evaluate and create, AI ethics
- Adapted from classic literacies; parallels Bloom's taxonomy, but dimensions interact
- Differs from digital literacy and broader frameworks (e.g., UNESCO 2024, ABCE)
- Newcomer questions: Is ethics separate or cross-cutting? Where does 'create' fit?



The Four Dimensions at a Glance



- **Know and understand AI:** core concepts, techniques, and societal impact
- **Use and apply AI:** selecting and operating tools purposefully for real tasks
- **Evaluate and create AI:** judging outputs for accuracy and bias, building artifacts
- **AI ethics:** fairness, privacy, accountability, transparency, responsible use



Dimensions interact as a set — not a one-way ladder; ethics is not optional.

Know and Understand AI: Core Concepts for Educators

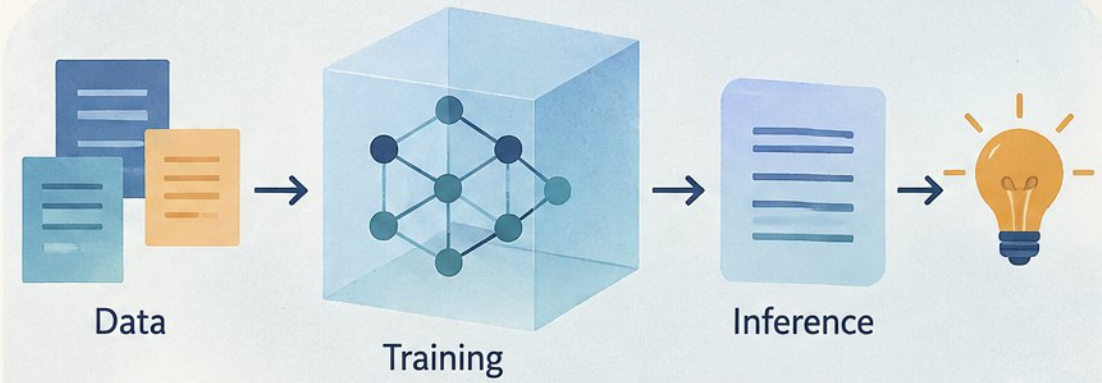
What counts as AI:
machine learning, rule-based systems, generative models, agentic systems

Data, training, inference, uncertainty: outputs are statistically likely, not verified facts

Three questions:
What kind is it? How did it learn? What does it do?

Societal impact:
automation, bias, and changing work and learning

Explain plainly and accurately—simplify without stating falsehoods







PEOPLE
IDEAS
A BRIGHTER
TOMORROW

Use and Apply AI:
From Tool Operation to Purposeful Pedagogy

- Start from learning goals, not tools: backward design for AI
- Effective prompts: clarity, context, style, constraints, and iteration
- AI as a thinking partner, not a replacement, across subjects
- Design higher-order tasks so AI deepens learning, not shortcuts
- Know when AI adds value—and when it does not





Evaluate and Create With AI: Critical Judgment and Production

- Evaluate AI outputs for accuracy, bias, relevance, depth, and source attribution
- Address hallucinations and deepfakes through structured fact-checking and verification
- Co-build content-quality checklists and rubrics with students
- Creative production: co-writing, coding, image generation, making student thinking visible
- Assess transparency: AI-use statements, verification logs, prompt appendices, process rubrics



HIGHER THINKING
BRIGHTER LEARNING

AI Ethics and Responsible Use in Schools

PEOPLE | LEARNING | A BRIGHTER TOMORROW

ETHICAL AI
STRONGER LEARNERS

- Core issues: privacy, fairness, transparency, accountability, and content ownership
- Academic integrity: disclose AI use; distinguish brainstorming from AI-written work
- Bias in AI outputs harms learners; keep human decision-making central
- Teachers model responsible use; schools adopt clear AI policies
- Age-appropriate activities build ethical reasoning from primary to secondary

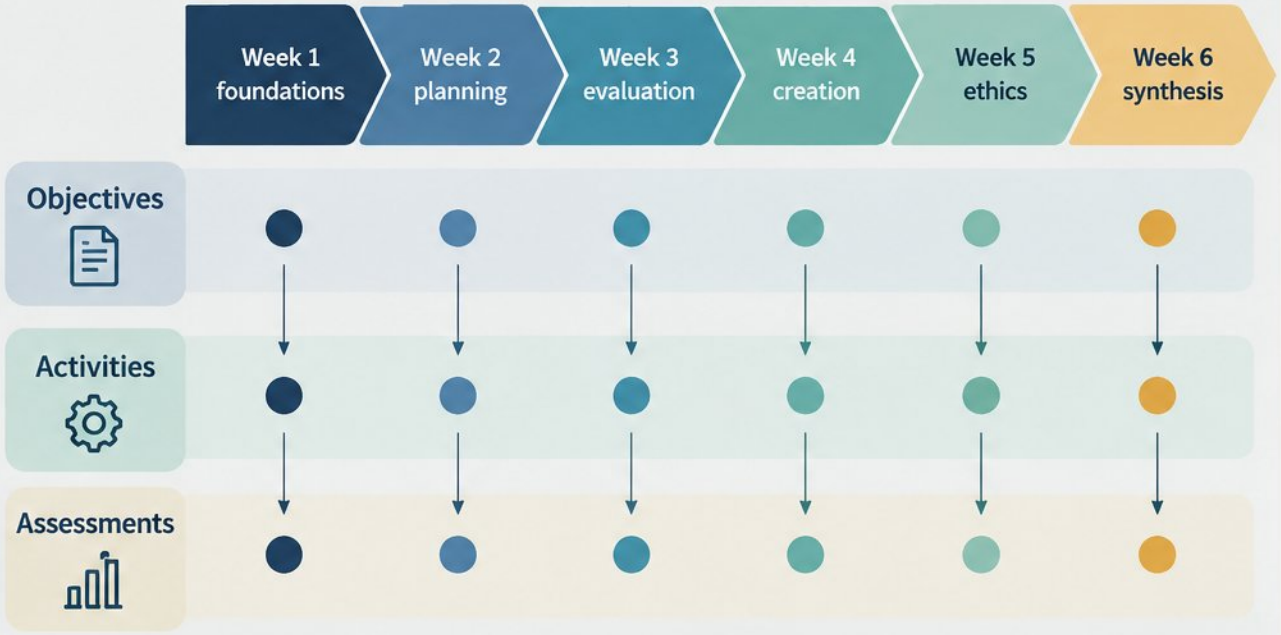


STRONGER SCHOOLS
BRIGHTER FUTURES

Applying the Framework to Lesson and Module Design

- Map existing lessons to the four dimensions to spot coverage gaps
- Write objectives per dimension, from concepts to evaluation and ethics
- Design activities and assessments covering conceptual, practical, evaluative, ethical learning
- Sample six-week module: foundations, planning, evaluation, creation, ethics, synthesis
- Avoid coverage bias toward tool use at the expense of evaluation and ethics

Six-Week Module Blueprint



Mapping Lessons to the Four Dimensions

	Conceptual	Practical	Evaluative	Ethical
Lesson A	●	●		●
Lesson B	●			●
Lesson C		●	●	
Lesson D				●

Avoid coverage bias toward tool use at the expense of evaluation and ethics.

Using the Framework for Program and Course Evaluation

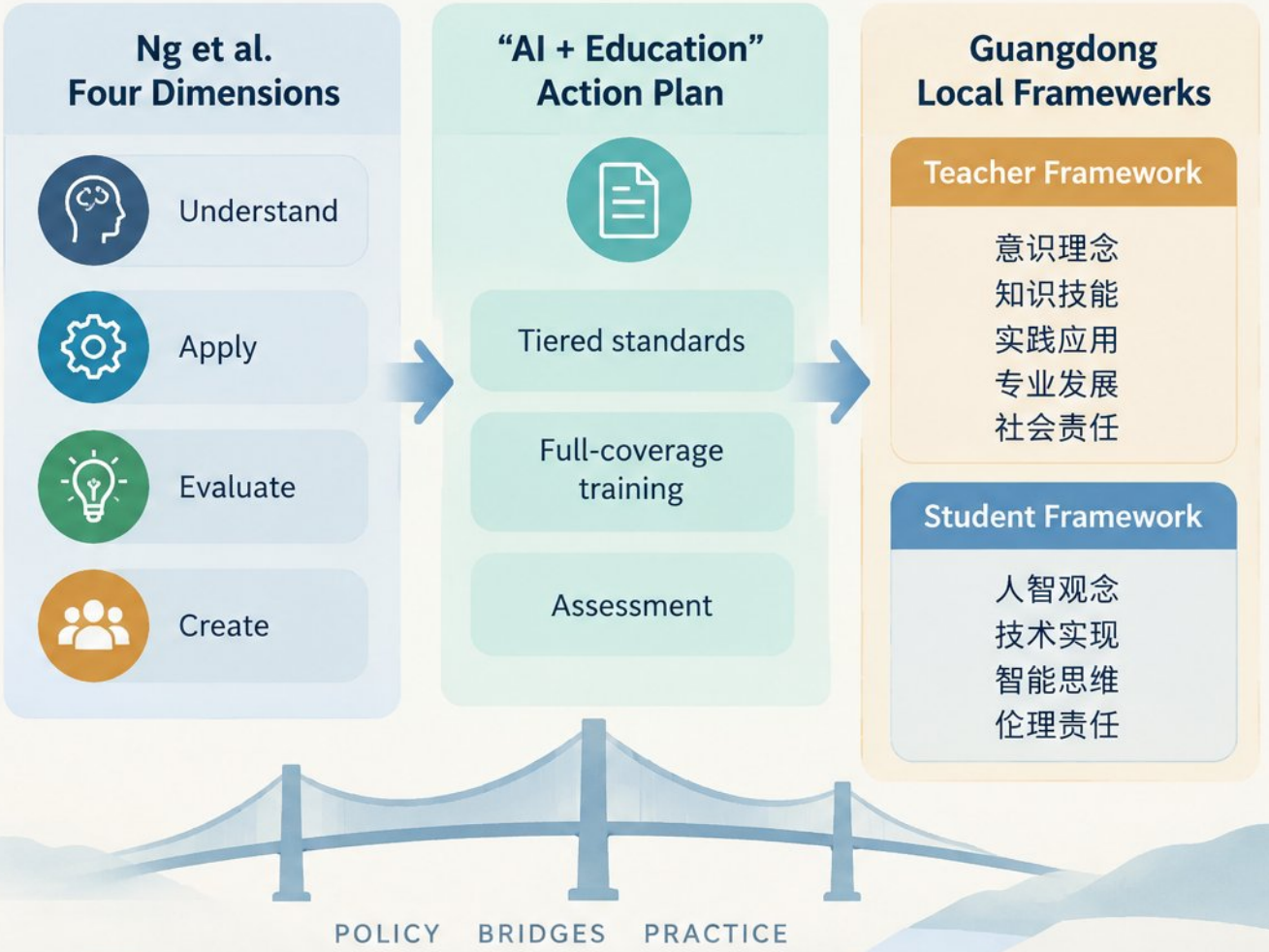
- Convert the four dimensions into evaluative criteria and indicators
- Review course documents and student artifacts for coverage and alignment
- Gather evidence via artifacts, observation, surveys, and validated questionnaires
- **Strength:** conceptual depth for mapping coverage and alignment
- Limitation: limited empirical validation and cultural specificity
- Use self-report cautiously; combine with performance and artifact evidence



Connecting the Framework to Chinese Policy and Local Frameworks

FROM INTERNATIONAL PERSPECTIVES TO LOCAL PRACTICE

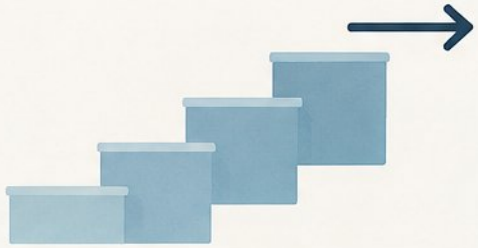
- Map Ng et al. dimensions onto Guangdong teacher and student AI literacy frameworks
- Align with the 'AI + Education' Action Plan: tiered standards, full-coverage training, assessment
- Ng adds value in evaluate, create, and integrated ethics—beyond local awareness/application emphasis
- Adapt terminology and examples for Chinese schools; retain original English terms
- Guangdong teacher framework: 意识理念, 知识技能, 实践应用, 专业发展, 社会责任
- Guangdong student framework: 人智观念, 技术实现, 智能思维, 伦理责任



EDUCATION FOR A BRIGHTER TOMORROW

Common Pitfalls and Critiques of the Framework

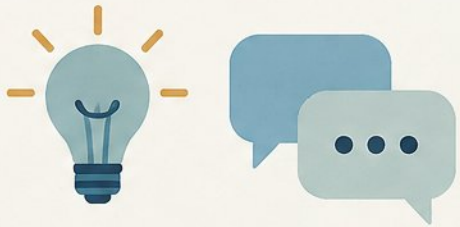
- Pitfall: treating the four dimensions as a rigid, linear sequence
- Tool use overemphasized; ethics added as an afterthought
- “Create” misread as requiring coding expertise, not critique or co-creation
- Critiques: limited empirical validation, self-report dependence
- Hong Kong, pre-generative-AI origin — test for mainland Chinese fit



Not a rigid, linear sequence



Balance tool use with ethics from the start



“Create” includes critique and co-creation



Consider validation limits and context of origin

Workshop Activity: Mapping a Lesson to the Four Dimensions

- Small groups: select an existing lesson or AI literacy unit
- Map objectives, activities, and assessments to the four dimensions
- Identify coverage gaps; redesign one activity for evaluation, creation, or ethics
- Peer review with a simple dimension-coverage matrix
- Debrief: common patterns, trade-offs, and local constraints



Next Steps: Self-Assessment, Professional Learning, and Action Planning

- Self-assess your AI literacy across the four dimensions with a short rubric
- Short-term actions: pilot, map, revise, and evaluate
- Build a professional learning community around AI literacy
- Leverage national platforms and teacher development resources
- Read Ng et al. (2021, 2024) and related validation studies
- Reflection: commit to one concrete next step





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