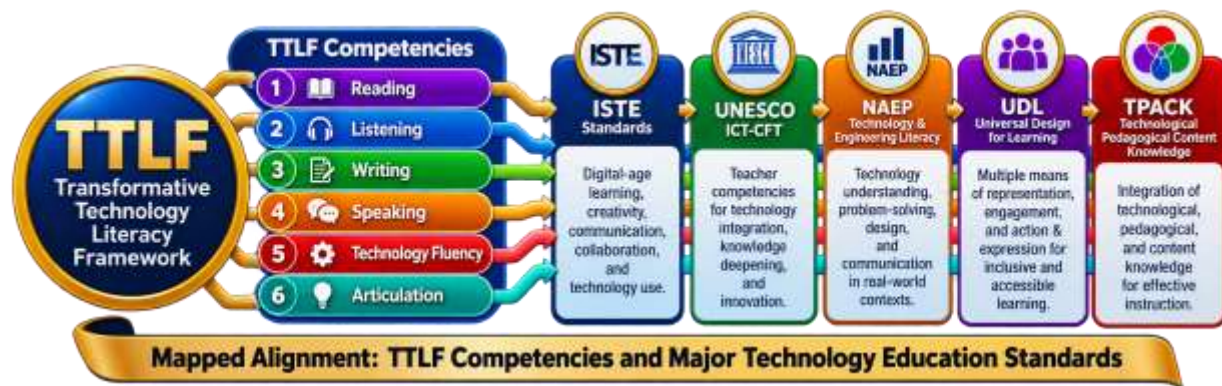


Zengage Learning TTLF Competencies Mapped to Five Major Technology Education Standards



Zengage Learning's [Transformative Technology Literacy Framework \(TTLF\)](#) can serve as a competency-based bridge connecting technology education standards to practical learning, instruction, assessment, and career readiness.

The comparison below maps TTLF's six core competencies — **Reading, Listening, Writing, Speaking, Technology Fluency, and Articulation** — to five major frameworks: ISTE Standards, UNESCO ICT Competency Framework for Teachers (ICT-CFT), NAEP Technology and Engineering Literacy (TEL), Universal Design for Learning (UDL), and TPACK.

An important distinction: these frameworks have different purposes. **ISTE** and **UNESCO** provide standards and competency guidance; **NAEP** defines a technology and engineering literacy assessment framework; **UDL** guides inclusive learning design; and **TPACK** describes the knowledge teachers need to integrate technology, pedagogy, and subject content. The mappings below are a proposed alignment of related competencies, not a claim that the frameworks formally endorse TTLF or use identical terminology.

1. Master alignment matrix

The matrix identifies where each TTLF competency has a strong, supporting, or indirect conceptual relationship with each framework.

Alignment key: ● Strong conceptual alignment · ◐ Supporting alignment · ○ Indirect or context-dependent alignment. These are analytical judgments, not official ratings.

TTLF competency	ISTE	UNESCO ICT-CFT	NAEP TEL	UDL TPACK	
Reading	●	●	●	●	◐
Listening	◐	◐	◐	●	◐
Writing	●	●	●	●	◐
Speaking	●	●	●	●	◐
Technology Fluency	●	●	●	◐	●
Articulation	●	●	●	●	●

2. Detailed Mapping by TTLF Competency

1. Reading

TTLF outcome: Learners can locate, read, interpret, and critically evaluate technology-related information, terminology, documentation, and digital content.

- ISTE: Knowledge Constructor — research, evaluate sources, and build knowledge from digital resources.
- UNESCO: Knowledge acquisition and deepening — use digital resources to develop subject knowledge and support learning.

- NAEP: Information and Communication Technology — search for information, analyze data, and identify distortion or misinterpretation.
- UDL: Representation — clarify vocabulary and symbols, support decoding, and connect new concepts with prior knowledge.
- TPACK: Content Knowledge and Technological Content Knowledge — understand subject concepts and how technology represents or transforms them.

Suggested evidence: annotated technical articles, vocabulary assessments, source evaluations, and technology concept summaries.

2. Listening

TTLF outcome: Learners can comprehend spoken explanations, technical presentations, narrated tutorials, and collaborative discussions.

- ISTE: Creative Communicator and Global Collaborator — receive and exchange ideas through appropriate communication channels.
- UNESCO: Teaching and learning, collaboration, and professional development — use technology-supported instruction and communication.
- NAEP: Communicating and Collaborating — interpret information shared through communication technologies and work with others.
- UDL: Representation and Engagement — provide multiple ways to perceive information and sustain attention and participation.

- TPACK: Pedagogical Knowledge and TPACK — design instruction that supports comprehension through appropriate teaching strategies and technology.

Suggested evidence: summaries of narrated courses, recorded verbal explanations, responses to technical presentations, and discussion reflections.

3. Writing

TTLF outcome: Learners can communicate technical understanding through clear, accurate, organized, and audience-appropriate written content.

- ISTE: Creative Communicator — express ideas clearly using digital tools and appropriate media.
- UNESCO: Digital content creation and communication — produce and share instructional or subject-related digital materials.
- NAEP: Information and Communication Technology — create text, visualizations, or models to address problems and communicate findings.
- UDL: Action and Expression — support multiple forms of composition, communication, and creative production.
- TPACK: Content Knowledge, Pedagogical Knowledge, and Technology Knowledge — combine subject understanding, instructional purpose, and suitable digital writing tools.

Suggested evidence: technical explanations, reports, AI-generated content critiques, digital portfolios, and project documentation.

4. Speaking

TTLF outcome: Learners can verbally explain concepts, discuss technology applications, present solutions, and respond to questions.

- ISTE: Creative Communicator and Global Collaborator — communicate ideas effectively and collaborate with diverse audiences.
- UNESCO: Digital communication and collaborative learning — use appropriate communication technologies to support learning and professional exchange.
- NAEP: Communicating and Collaborating — present and justify decisions, analyses, recommendations, and design choices.
- UDL: Action and Expression — enable different communication methods and modes of response.
- TPACK: Integrated instructional practice — use appropriate presentation technologies and teaching approaches to explain subject matter.

Suggested evidence: oral examinations, recorded presentations, demonstrations, technical interviews, and project defenses.

5. Technology Fluency

TTLF outcome: Learners can understand, select, use, evaluate, and apply technologies to solve problems and accomplish academic or professional goals.

- ISTE: Empowered Learner, Computational Thinker, and Innovative Designer — use technology purposefully to learn, solve problems, and create solutions.

- UNESCO: Technology Literacy, Knowledge Deepening, and Knowledge Creation — progress from foundational technology use to more sophisticated applications.
- NAEP: Technology and Society, Design and Systems, and Information and Communication Technology — understand technological systems and apply knowledge to real-world problems.
- UDL: Action and Expression — use accessible tools and varied methods to interact, create, and demonstrate learning.
- TPACK: Technological Knowledge and integrated TPACK — understand technology capabilities and select tools appropriate to subject matter and instructional goals.

Suggested evidence: hands-on tasks, simulations, technology demonstrations, troubleshooting exercises, and applied projects.

6. Articulation

TTLF outcome: Learners can synthesize their knowledge and clearly explain what they know, how they know it, why it matters, and how they can apply it.

- ISTE: Knowledge Constructor and Creative Communicator — synthesize information, construct understanding, and communicate it for a specific purpose.
- UNESCO: Knowledge Creation and professional competency development — use knowledge to develop solutions, communicate insights, and support innovation.
- NAEP: Communicating and Collaborating — justify conclusions, explain design decisions, and present evidence-based recommendations.

- UDL: Action and Expression — provide accessible ways for learners to demonstrate understanding, reflect, and communicate learning.
- TPACK: Integrated Technological Pedagogical Content Knowledge — explain and justify how technology, instructional methods, and subject knowledge work together.

Suggested evidence: competency demonstrations, reflective portfolios, case-study defenses, teach-back activities, and evidence-based explanations of prior learning.

3. How TTLF extends the frameworks through a common competency model

The frameworks contribute different pieces of the instructional process. TTLF can connect those pieces through a consistent set of competencies that can be developed, demonstrated, assessed, and validated.

TTLF: Six Core Competencies

Reading · Listening · Writing · Speaking · Technology Fluency · Articulation

ISTE

Digital-age learner, educator, communication, creativity, and problem-solving competencies.

UNESCO ICT-CFT

Teacher development, technology integration, knowledge deepening, and innovation.

NAEP TEL

Technology understanding, practical problem-solving, design, and communication.

UDL

Accessible representation, engagement, and flexible ways to express learning.

TPACK

Integration of technological, pedagogical, and content knowledge in instructional practice.

Observable Learning Evidence

Coursework · Practical tasks · Presentations · Assessments · Projects · Portfolios · Demonstrations

4. Applying the mapping across the Zengage Learning System

Zengage Learning component	Role in standards alignment
TTLF	Defines the six competencies and provides a common structure for organizing learning outcomes.
TTLMS — Transformative Technology Literacy Microlearning Series	Develops foundational and applied knowledge across 40 technology subjects.
TTLML — Transformative Technology Literacy Microlearning Library	Provides supporting resources, tutorials, assessments, and study materials for competency development.
Assessment and validation	Uses knowledge checks, practical tasks, presentations, and portfolios to collect evidence of learning.

Recognition and career readiness

Helps learners articulate their competencies for academic progression, professional development, and employment opportunities.

The instructional design opportunity is to use the same six competencies across multiple technology subjects while adapting the learning activities and evidence requirements to the applicable standards.

For example, a Generative AI and LLMs course could ask a learner to read technical documentation, listen to an explanation of retrieval-augmented generation (RAG), write an analysis of its limitations, present a use case, demonstrate a suitable AI workflow, and articulate the reasoning behind the solution. One integrated activity could generate evidence relevant to several TTLF competencies and multiple standards.

5. Recommended implementation approach

1. Define outcomes: Specify observable performance for each of the six TTLF competencies.
2. Map standards: Identify the applicable ISTE, UNESCO, NAEP, UDL, and TPACK concepts for each course outcome.
3. Design accessible learning: Provide varied learning materials and appropriate ways to practice and demonstrate understanding.
4. Assess performance: Use knowledge checks alongside authentic tasks, communication activities, and technology demonstrations.

5. Document evidence: Maintain portfolios that connect demonstrated competencies to course outcomes and applicable standards.
6. Validate and recognize: Establish transparent criteria for determining proficiency and communicating what a learner has demonstrated.

Bottom line: TTLF can function as the shared competency layer connecting the five frameworks to the Transformative Technology Literacy learning ecosystem. Its distinctive contribution is the explicit inclusion of **Articulation** alongside foundational communication skills and Technology Fluency, creating a practical way to connect understanding with demonstrated ability. The strength of the alignment will depend on explicit learning outcomes, documented evidence, and assessment criteria — not simply on listing the frameworks together.

Transformative Technology Literacy Microlearning Library (TTLML)



Transformative Technology Literacy Microlearning Library