California Emerging Technology Fund
Overview of Digital Literacy Framework
August 2021

Introduction and Overview

The California Emerging Technology Fund (CETF) identified Digital Literacy as a fundamental strategy to close the Digital Divide through increased broadband adoption in its original 2007 Strategic Action Plan. In 2008 CETF established a Digital Literacy Initiative and convened stakeholders in collaboration with the Governor's Office to review all existing Digital Literacy standards to recommend a coherent policy and framework for Information and Communications Technology (ICT) Skills. CETF published a Summary Report reflecting stakeholder consensus titled *California Basic Elements of ICT Digital Literacy – Continuum of Assessment Skills* which embraced the United Nations Educational, Scientific and Cultural Organization (UNESCO) definition of Digital Literacy as "a lifelong learning process of capacity building for using digital technology, communications tools, and/or networks to access, manage, integrate, evaluate, create and communicate information in order to function in a knowledge-based economy and society" accompanied by the following Framework of Basic Digital Literacy with 6 Elements.

In 2009 CETF secured a Governor's Executive Order (S-06-09) on Digital Literacy and ICT Skills which required the California Technology Agency to prepare an action plan which reaffirmed the Framework in the 2010 report required titled *Digital Literacy Pathways in California*. The Executive Order remains in force today.

UNESCO Framework for Digital Literacy

BASIC ELEMENTS OF DIGITAL LITERACY		
Elements	Definitions	Competencies
Access	Knowing about and knowing how to collect and/or retrieve information.	Search, find, and retrieve information in digital environments.
Manage	Applying an existing organizational or classification scheme.	Conduct a rudimentary and preliminary organization of accessed information for retrieval and future application.
Integrate	Interpreting and representing information - summarizing, comparing, and contrasting.	Interpret and represent information by using ICT tools to synthesize, summarize, compare, and contrast information from multiple sources.
Evaluate	Making judgments about the quality, relevance, usefulness, or efficiency of information.	Judge the currency, appropriateness, and adequacy of information and information sources for a specific purpose (including determining authority, bias, and timelines of materials).
Create	Generating information by adapting, applying, designing, inventing, or authoring information.	Adapt, apply, design, or invent information in ICT environments (to describe an event, express an opinion, or support a basic argument, viewpoint or position).
Communicate	Communicate information persuasively to meet needs of various audiences through use of an appropriate medium.	Communicate, adapt, and present information properly in its context (audience, media) in ICT environments and for a peer audience.
Note: Existing international and national digital literacy frameworks and assessment instruments all share these common elements.		

CETF considers the first 3 Elements (Access, Manage, Integrate) foundational for Digital Literacy training for unconnected residents and the second 3 Elements (Evaluate, Create, Communicate) as integral to Education and Workforce Training Programs with STEM (Science, Technology, Engineering, and Math) and/or ICT Skills curricula.

Relationship of UNESCO Framework to Other Rubrics

The UNESCO definition of Digital Literacy and the Framework with the 6 Elements aligns well with other rubrics set forth by respected professional organizations. The following resources and rubrics have been reviewed for comparison to the UNESCO Framework:

- California Department of Education (CDE) and State Board of Education (SBE) Common Core State Standards and Local Control Funding Formula (LCFF) 8 Priorities
- International Society for Technology and Education (ISTE)
- American Library Association
- Partnership for 21st Century Learning
- CDE and SBE Computer Science Standards
- CDE California AfterSchool Network (CAN) Program
- California Workforce Development Board SlingShot Initiative for ICT Skills

CDE and SBE Common Core State Standards

The Common Core State Standards (CCSS) set Digital Literacy knowledge and skill expectations for students, broken down into 3 categories with aligned skill set building objectives as summarized in the chart below:

Digital Literacy Categories According to the CCSS K-12 Technology Scope and Sequence Document

Digital Literacy Categories	
Demonstrate proficiency in the use of computers and applications as well as an understanding of the concepts underlying hardware, software, and connectivity.	Basic Operations Word Processing Spreadsheet Multimedia and Presentation Tools
Demonstrate the responsible use of technology and an understanding of ethics and safety issues in using electronic media at home, in school and in society.	Acceptable Use, Copyright and Plagiarism
Demonstrate the ability to use technology for research, critical thinking, decision-making, communication and collaboration, creativity and innovation.	Research and Gathering Information Communication and Collaboration

Note: Adapted from the CCSS K-12 Technology Scope and Sequence Document (LBUSD, n.d.)

International Society for Technology and Education

The International Society for Technology and Education (ISTE) identifies 14 Essential Conditions as critical elements necessary to effectively leverage technology for learning that provide a research-backed framework to guide system-wide change.

1. Shared Vision	8. Technical Supports
2. Empowered Leaders	9. Curriculum Framework
3. Implementation Planning	10. Student-Centered Learning
4. Consistent and Adequate Funding	11. Assessment and Evaluation
5. Equitable Access	12. Engaged Communities
6. Skilled Personnel	13. Support Policies
7. Ongoing Professional Learning	14. Supportive External Content

ISTE also has promulgated standards for administrators, teachers, students and the community. The Student Standards are relevant for considering digital proficiency standards for residents. They are intended to "empower" the individual as the "driver" of the process.

Standard	Description of Observed Demonstration of Skills
1. Empowered Learner	Students leverage technology to take an active role in choosing, achieving and demonstrating competency in their learning goals, informed by the learning sciences.
2. Digital Citizen	Students recognize the rights, responsibilities and opportunities of living, learning and working in an interconnected digital world, and they act and model in ways that are safe, legal and ethical.
3. Knowledge Constructor	Students critically curate a variety of resources using digital tools to construct knowledge, produce creative artifacts and make meaningful learning experiences for themselves and others.
4. Innovative Designer	Students use a variety of technologies within a design process to identify and solve problems by creating new, useful or imaginative solutions.
5. Computational Thinker	Students develop and employ strategies for understanding and solving problems in ways that leverage the power of technological methods to develop and test solutions.
6. Creative Communicator	Students communicate clearly and express themselves creatively for a variety of purposes using the platforms, tools, styles, formats and digital media appropriate to their goals.
7. Global Collaborator	Students use digital tools to broaden their perspectives and enrich their learning by collaborating with others and working effectively in teams locally and globally.

American Library Association

The American Library Association (ALA) recognizes that digital literacy, as with information literacy, requires skills in locating and using information in critical thinking. ALA further states that digital literacy involves knowing digital tools and using them in communicative, collaborative ways through social engagement. The ALA Digital Literacy Task Force defined digital literacy as "the ability to use information and communication technologies to find, evaluate, create, and communicate information, requiring both cognitive and technical skills."

Partnership for 21st Century Learning

The Partnership for 21st Century Learning, a national advocacy organization that promotes the integration of technology in education, classifies Digital Literacy along 3 dimensions:[i]

- Information Literacy: Ability to efficiently access, critically evaluate, innovatively utilize, and successfully manage information for various purposes while adhering to ethical and legal standards.
- Media Literacy: Ability to examine the function of media and effectively analyze and utilize messages received through various forms of media.
- Information Communication Technology: Ability to successfully utilize digital technologies as a tool to research, organize, evaluate and communicate information.

Diverse Statewide Experience Informs Essential Digital Literacy Proficiency Skills

CETF works statewide with a network of community-based organizations (CBOs) and public agencies to increase Digital Literacy. Since 2008 CETF grantees and partners have provided Digital Literacy Training to almost 1M people, including: (a) delivering stand-alone training courses in community facilities; (b) assisting unconnected households become sufficiently digitally-proficient to sign up for an affordable home Internet service and acquire a computing device as part of achieving adoptions; (c) training parents of students participating in School2Home; (d) managing the City of San José Digital Inclusion Partnership Grants that require digital skills proficiency as part of achieving adoptions; (e) training parents of students receiving 25,000 Chromebooks in 2020-2021 purchased by Frontier Communications; and (f) developing online training for T-Mobile Lifeline customers. Drawing on this experience, CETF developed Self-Assessments for each of the 3 Elements in the UNESCO Framework that focus on the most essential Digital Literacy Skills reported by CBOs and participant in training programs.

In the meantime, UNESCO published a new rubric of Digital Literacy Competencies. In 2018 the UNESCO Institute for Statistics (UIS), the UN depository for global statistics in education, science, technology, culture and communications, began development of a new methodology for measuring the "percentage of youth/adults who have achieved at least a minimum level of proficiency in digital literacy skills." To this end, UIS conducted comprehensive syntheses of existing frameworks and in-depth consultations to obtain expert feedback on the proposed Competencies. This work is documented in Information Working Paper No. 51, available at: https://bit.ly/2VsJwqI**.** The UIS UNESCO Competencies Framework delineates 5 Competence Areas and related Competencies for use worldwide in training and certification programs. The 5 Competence Areas are: (1.0) Information and Data Literacy; (2.0) Communication and Collaboration; (3.0) Digital Content Creation; (4.0) Safety; and (5.0) Problem Solving. UIS also added an optional Area (0.0) related to devices, hardware and software operations, and a graphical user interface. Each Competence Area has 3-8 Competencies, each more complex than the previous one. The Competencies emphasize personal data security and social media digital identity and span the Digital Literacy 3 Elements.

CETF incorporated the new Competencies Framework into an updated Self-Assessment Tool structured with 5 Questions for each of the 3 Elements to focus on the 15 most essential Skills with a 5-point rating scale for sufficient diagnosis and differentiation of Digital Literacy Proficiency to appropriately group participants for Workshops and tailor Training.

CETF Digital Literacy Self-Assessment Tool

Digital Literacy Element 1: Access

How hard are the following tasks for you to do without help from someone?

ABILITY TO ACCESS ONLINE INFORMATION	**1 Very Hard** 	**2 Hard** 	**3 Unsure** 	**4 Easy** 	**5 Very Easy** 
a. Understand the basic features of a computer including: Operating Systems (Apple IOS, Android, Windows); Internet Browsers (Safari, Google Chrome, Microsoft Explorer); and Software Applications (Google Workspace and Microsoft Office)?					
b. Protect your computer with secure passwords and security software?					
c. Search for information online about health, jobs, school, housing, DMV, and other public services?					
d. Protect your online accounts (email accounts, bank accounts, and shopping accounts) from others?					
e. Compose and send an email (and create an email account if needed)?					

Digital Literacy Element 2: Manage

How hard are the following tasks for you to do without help from someone?

ABILITY TO MANAGE ONLINE INFORMATION	1 Very Hard 	2 Hard 	3 Unsure 	4 Easy 	5 Very Easy 
f. Communicate safely with others using text or email?					
g. Send photos or other documents as an attachment to an email?					
h. Start and join a video conference call using applications, such as Zoom, WhatsApp, or others?					
i. Use a personal social media account safely, such as Facebook, Instagram, Pinterest, or others?					
j. Access and view a public meeting online, such as city council, school board, or neighborhood meeting?					

Digital Literacy Element 3: Integrate

How hard are the following tasks for you to do without help from someone?

ABILITY TO INTEGRATE ONLINE INFORMATION	**1 Very Hard** 	**2 Hard** 	**3 Unsure** 	**4 Easy** 	**5 Very Easy** 
a. Submit online forms, such as a job application, driver's license renewal, or school registration?					
b. Create digital content, such as a resume, note to your child's teacher, or a photo album?					
c. Take or download a photo and edit it using tools, such as cropping and filters and save for future use?					
d. Use your device to make a short video (about 10 seconds) to share with others online?					
e. Make sure your social media posts and other online content you make protects your reputation?					