

# COMPETENCES

## 1. ISTE STUDENTS

### 1.1. 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,

#### *1.1.1. Students:*

articulate and set personal learning goals, develop strategies leveraging technology to achieve them and reflect on the learning process itself to improve learning outcomes.

### 1.2. Digital Citizen

### 1.3. Knowledge Constructor

### 1.4. Innovative Designer

### 1.5. Computational Thinker

### 1.6. Creative Communicator

### 1.7. Global Collaborator

## 2. ISTE EDUCATORS

### 2.1. Learner

### 2.2. Leader

### 2.3. Citizen

### 2.4. Collaborator

### 2.5. Designer

## 3. ISTE EDUCATION LEADERS

### 3.1. Equity and Citizenship Advocate

### 3.2. Visionary Planner

**3.3. Empowering Leader**

**3.4. Systems Designer**

**3.5. Connected Learner**

#### **4. ISTE COACHES**

**4.1. Change Agent**

**4.2. Connected Learner**

**4.3. Collaborator**

**4.4. Learning Designer**

**4.5. Professional Learning Facilitator**

**4.6. Data-Driven Decision-Maker**

**4.7. Digital Citizen Advocate**

#### **5. ISTE COMPUTATIONAL THINKING COMPETENCIES FOR EDUCATORS**

**5.1. Computational Thinking (Learner)**

**5.2. Equity Leader (Leader)**

**5.3. Collaborating Around Computing (Collaborator)**

**5.4. Creativity & Design (Designer)**

**5.5. Integrating Computational Thinking (Facilitator)**

#### **6. TPACK**

**6.1. Technological Knowledge (TK)**

Technology knowledge (TK) is knowledge about standard technologies, such as books, chalk and blackboard, and more advanced technologies, such as the Internet and digital video. This involves the skills required to operate particular technologies. In the case of digital technologies, this includes knowledge of operating systems and computer hardware, and the ability to use standard sets of software tools such as word processors, spreadsheets, browsers, and e-mail. TK includes knowledge of how to install and remove peripheral devices, install and remove software programs, and create and archive documents. Most standard technology workshops and tutorials tend to focus on the acquisition of

such skills. Since technology is continually Technological Pedagogical Content Knowledge 1027 changing, the nature of TK needs to shift with time as well. For instance, many of the examples given above (operating systems, word processors, browsers, etc.) will surely change, and maybe even disappear, in the years to come. The ability to learn and adapt to new technologies (irrespective of what the specific technologies are) will still be important.

## **6.2. Technological Content Knowledge (TCK)**

Technological content knowledge (TCK) is knowledge about the manner in which technology and content are reciprocally related. Although technology constrains the kinds of representations possible, newer technologies often afford newer and more varied representations and greater flexibility in navigating across these representations. Teachers need to know not just the subject matter they teach but also the manner in which the subject matter can be changed by the application of technology. For example, consider Geometer's Sketchpad as a tool for teaching geometry. It allows students to play with shapes and form, making it easier to construct standard geometry proofs. In this regard, the software program merely emulates what was done earlier when learning geometry. However, the computer program does more than that. By allowing students to "play" with geometrical constructions, it also changes the nature of learning geometry itself; proofs by construction are a form of representation in mathematics that was not available prior to this technology. Similar arguments can be made for a range of other software products.

## **6.3. Technological Pedagogical Knowledge (TPK)**

Technological pedagogical knowledge (TPK) is knowledge of the existence, components, and capabilities of various technologies as they are used in teaching and learning settings, and conversely, knowing how teaching might change as the result of using particular technologies. This might include an understanding that a range of tools exists for a particular task, the ability to choose a tool based on its fitness, strategies for using the tool's affordances, and knowledge of pedagogical strategies and the ability to apply those strategies for

use of technologies. This includes knowledge of tools for maintaining class records, attendance, and grading, and knowledge of generic technology-based ideas such as WebQuests, discussion boards, and chat rooms.

#### **6.4. Technological Pedagogical Content Knowledge (TPACK)**

Technological pedagogical content knowledge (TPCK) is an emergent form of knowledge that goes beyond all three components (content, pedagogy, and technology). This knowledge is different from knowledge of a 1028 Teachers College Record disciplinary or technology expert and also from the general pedagogical knowledge shared by teachers across disciplines. TPCK is the basis of good teaching with technology and requires an understanding of the representation of concepts using technologies; pedagogical techniques that use technologies in constructive ways to teach content; knowledge of what makes concepts difficult or easy to learn and how technology can help redress some of the problems that students face; knowledge of students' prior knowledge and theories of epistemology; and knowledge of how technologies can be used to build on existing knowledge and to develop new epistemologies or strengthen old ones.

### **7. CFT**

#### **7.1. Understanding ICT in Education Policy (aspect)**

This aspect encourages teachers to be aware of how ICT might be aligned to national education priorities as expressed within the policy environment. Teachers are encouraged to understand their significant role in preparing the next generation to be effective and productive members of society. At the Knowledge Acquisition level, teachers are made aware of ICT in Education policies. They are later encouraged to understand and apply policy directives within the Knowledge Deepening level, and then critique national education reform policies and suggest enhancements in the Knowledge Creation level.

##### *7.1.1. Curricular goals for teacher training*

### 7.1.2. Teacher competency (actually descriptor)

Each encounter aspect level builds a competence, but not described  
(Teachers can ...)

Articulate how their classroom practices correspond to and support institutional and/or national policy.

### 7.1.3. Objectives

(Teachers should be able to ...)

### 7.1.4. Examples

example activities

#### Knowledge Acquisition

	CURRICULAR GOALS FOR TEACHER TRAINING	TEACHER COMPETENCY (Teachers can ...)	OBJECTIVES (Teachers should be able to ...)	EXAMPLE ACTIVITIES
ASPECT 1 <i>Understanding ICT in Education Policy</i>	<b>Policy Understanding.</b> Teachers make connections between policy and classroom practices.	Articulate how their classroom practices correspond to and support institutional and/or national policy.	<b>KA.1.a.</b> Identify how policy implementation is shaping classroom practice.	Discuss institutional and/or national policies and common classroom practices. Identify those practices that support policy. Teachers identify and analyse their own classroom practices in terms of how their teaching practices contribute to policy implementation.
			<b>KA.1.b.</b> Identify the principles of using ICT in education in a safe and accessible manner.	Investigate the benefits, and also drawbacks, of using ICT in education. Identify appropriate ICT use to support and enhance their productivity, teaching methods, class administration and continuing professional development.
ASPECT 2 <i>Curriculum and Assessment</i>	<b>Basic Knowledge.</b> Teachers have a basic knowledge of the potential benefits of incorporating a range of relevant ICT resources and productivity tools into any subjects to support both teaching and learning and assessment.	Analyse curriculum standards and identify how ICT can be used pedagogically to support attainment of the standards.	<b>KA.2.a.</b> Match specific curriculum standards to particular software packages and computer applications and describe how these standards are supported by these applications.	Identify specific curriculum standards and identify software packages, digital tools and resources that support the attainment of these standards.
			<b>KA.2.b.</b> Search for and identify OER to support curriculum standards.	Search for OER, using both specialized and common search engines, and select open resources to teach specific curriculum standards.
			<b>KA.2.c.</b> Select ICT to support assessment strategies.	Identify how ICT can support different ways to assess students, such as portfolios, peer assessment, formative assessment and journal reflections. Teachers are introduced to dedicated e-assessment tools.

## 7.2. Curriculum and Assessment

## 7.3. Pedagogy

## 7.4. Application of Digital Skills

## 7.5. Organization and Administration

## 7.6. Teacher Professional Learning

## 8. DigCompEdu

## **8.1. Professional Engagement (area)**

Educators' digital competence is expressed in their ability to use digital technologies not only to enhance teaching, but also for their professional interactions with colleagues, learners, parents and other interested parties, for their individual professional development and for the collective good and continuous innovation in the organisation and the teaching profession. This is the focus of Area 1.

### *8.1.1. Organisational communication (competence)*

To use digital technologies to enhance organisational communication with learners, parents and third parties. To contribute to collaboratively developing and improving organisational communication strategies.

#### 8.1.1.1. Activities

To use digital technologies to make additional learning resources and information available to learners (and parents).

#### 8.1.1.2. Progression

Making little use of digital technologies for communication.

#### 8.1.1.3. Proficiency statements

I rarely use digital technologies for communication.

### *8.1.2. Professional collaboration*

### *8.1.3. Reflective practice*

### *8.1.4. Digital Continuous Professional Development (CPD)*

## **8.2. Digital Resources**

### *8.2.1. Selecting digital resources*

8.2.2. *Creating and modifying digital resources*

8.2.3. *Managing, protecting and sharing digital resources*

### **8.3. Teaching and Learning**

8.3.1. *Teaching*

8.3.2. *Guidance*

8.3.3. *Collaborative learning*

8.3.4. *Self-regulated learning*

### **8.4. Assessment**

8.4.1. *Assessment strategies*

8.4.2. *Analysing evidence*

8.4.3. *Feedback and planning*

### **8.5. Empowering Learners**

8.5.1. *Accessibility and inclusion*

8.5.2. *Differentiation and personalization*

8.5.3. *Actively engaging learners*

### **8.6. Facilitating Learners' Digital Competence**

8.6.1. *Information and media literacy*

8.6.2. *Digital communication and collaboration*

8.6.3. *Digital content creation*

8.6.4. *Responsible use*

8.6.5. *Digital problem solving*

## **9. DigCompOrg**

### **9.1. Leadership & Governance Practice (element)**

9.1.1. *Integration of Digital-age Learning is part of the overall mission,*

### *vision and strategy (sub-elements)*

Factors that foster effective learning including the integration and organisation-wide use of digital learning technologies are clearly embedded in statements of the mission, vision and strategy of the organisation.

#### 9.1.1.1. Descriptors

1. The potential of digital learning technologies is clearly flagged

The organisation's strategic/planning processes and documentation include a vision and mission that clearly articulates the potential of digital learning technologies to modernise educational practices, geared towards more comprehensive learning outcomes.

2. The benefits of digital learning technologies are communicated

3. The strategic plan encompasses digital-age learning

4. Open education is an aspect of public engagement

Sector-specific descriptor(s)

#### *9.1.2. Strategy for digitalage learning is supported by an implementation plan*

#### *9.1.3. A Management and Governance Model is in place*

#### 9.1.3.1. Sector Specific Sub-Elements

#### **9.2. Teaching and Learning Practices**

#### **9.3. Professional Development**

#### **9.4. Assessment practices**

#### **9.5. Content and Curricula**

#### **9.6. Collaboration and Networking**

#### **9.7. Infrastructure**

#### **9.8. Sector Specific Elements**

### **10. DigComp 2.2**

#### **10.1. Information and data literacy (area)**

10.1.1. *Browsing, searching and filtering data, information and digital content (competence)*

To articulate information needs , to search for data, information and content in digital environments, to access them and to navigate between them. To create and update personal search strategies.

10.1.1.1. Descriptors by level

At basic level and with guidance, I can: • identify my information needs, find data, information and content through a simple search in digital environments, • find how to access these data, information and content and navigate between them, • identify simple personal search strategies.

10.1.1.2. Examples of knowledge, skills and attitudes

10.1.1.3. Use cases

10.1.2. *Evaluating data, information and digital content*

10.1.3. *Managing data, information and digital content*

10.2. **Communication and collaboration**

10.2.1. *Interacting through digital technologies*

10.2.2. *Sharing through digital technologies*

10.2.3. *Engaging in citizenship through digital technologies*

10.2.4. *Collaborating through digital technologies*

10.2.5. *Netiquette*

10.2.6. *Managing digital identity*

10.3. **Digital content creation**

10.3.1. *Developing digital content*

10.3.2. *Integrating and re-elaborating digital content*

10.3.3. *Copyright and licenses*

10.3.4. *Programming*

#### 10.4. **Safety**

- 10.4.1. *Protecting devices*
- 10.4.2. *Protecting personal data and privacy*
- 10.4.3. *Protecting health and well-being*
- 10.4.4. *Protecting the environment*

#### 10.5. **Problem solving**

- 10.5.1. *Solving technical problems*
- 10.5.2. *Identifying needs and technological responses*
- 10.5.3. *Creatively using digital technologies*
- 10.5.4. *Identifying digital competence gaps*

### **11. DLGF**

#### 11.1. **Devices and software operations (areas)**

- 11.1.1. *Physical operations of digital devices\*\**
- 11.1.2. *Software operations in digital devices\*\**

##### 11.1.2.1. Case Examples

#### 11.2. **Information and data literacy**

- 11.2.1. *Browsing, searching and filtering data, information and digital content*
- 11.2.2. *Evaluating data, information and digital content*
- 11.2.3. *Managing data, information and digital content*

#### 11.3. **Communication and collaboration**

- 11.3.1. *Interacting through digital technologies*
- 11.3.2. *Sharing through digital technologies*
- 11.3.3. *Engaging in citizenship through digital technologies*

11.3.4. *Collaborating through digital technologies*

11.3.5. *Netiquette*

11.3.6. *Managing digital identity*

#### **11.4. Digital content creation**

11.4.1. *Developing digital content*

11.4.2. *Integrating and re-elaborating digital content*

11.4.3. *Copyright and licenses*

11.4.4. *Programming*

#### **11.5. Safety**

11.5.1. *Protecting devices*

11.5.2. *Protecting personal data and privacy*

11.5.3. *Protecting health and well-being*

11.5.4. *Protecting the environment*

#### **11.6. Problem solving**

11.6.1. *Solving technical problems*

11.6.2. *Identifying needs and technological responses*

11.6.3. *Creatively using digital technologies*

11.6.4. *Identifying digital competence gaps*

11.6.5. *Computational thinking*

#### **11.7. Career-related competences**

11.7.1. *Operating specialised digital technologies for a particular field*

11.7.2. *Interpreting and manipulating data, information and digital content for a particular field*

### **12. DigCompConsumers**

## 12.1. **Pre-purchase (area)**

### 12.1.1. *Browsing, searching and filtering information on goods and services (competence)*

To search for and access information related to goods and services using digital tools. To identify and select the information needed regarding goods, services, and transactions options.

#### 12.1.1.1. Knowledge examples

Recognising that search engines are not neutral, and that search results and ranking of search results of goods and services are influenced by advertising and marketing Being aware that different search engine

#### 12.1.1.2. Skills examples

#### 12.1.1.3. Attitude examples

### 12.1.2. *Evaluating and comparing information on goods and services*

### 12.1.3. *Recognising and evaluating commercial communication and advertisement*

### 12.1.4. *Managing digital identity and profile in the digital marketplace*

### 12.1.5. *Considering responsible and sustainable consumption in digital markets*

## 12.2. **Purchase**

### 12.2.1. *Interacting in the digital marketplace to buy and sell*

### 12.2.2. *Participating in collaborative economy platforms*

### 12.2.3. *Managing payments and finances through digital means*

### 12.2.4. *Understanding copyrights, licences, and contracts of digital goods and services*

12.2.5. *Managing personal data and privacy*

12.2.6. *Protecting health and safety*

12.3. **Post-purchase**

12.3.1. *Sharing information with other consumers in the digital marketplace*

12.3.2. *Asserting consumer rights in the digital marketplace*

12.3.3. *Identifying digital consumer competence gaps and limits*