

Curriculum Leadership Institute E-Hint

The Curricular Architecture that Embodies Both 21st Century Skills and Technology Literacy—Part 2

The previous E-hint of this same title suggested there is more to creating a curricular architecture for 21st Century Skills and Technology Literacy than is typically understood. In that E-hint are recommendations that: (1) there be a conscious effort to merge elements of 21st Century Skills and ISTE (Technology Literacy) Standards into a workable and mutually supportive construct; (2) such a construct be weighted in favor of ISTE Standards because they are more specific in terms of implementing 21st Century Skills; and (3) instructional delivery locations and systems be clearly established. Condensed versions of the ISTE skills are shown in the left column of the table below, and in the right column are the suggested delivery systems:

	ISTE Standards (specific skills)	Primary Delivery
1	research, interactive fluency, and operations and concepts	collaboration among specialized tech lit teachers and teachers of all other courses and grade levels
2	communication, collaboration and digital citizenship	teachers of all courses and grade levels
3	creativity and innovation	teachers of all courses and grade levels
4	critical thinking, real problem solving, and logical decision making	teachers of all courses and grade levels

At the end of the previous E-hint is the observation that most districts today sponsor a **technology committee** that helps each core subject area committee (or some other planning group) support their curricula with hardware, software and connectivity appropriate to the needs of each specific discipline. It was also indicated that increasingly more districts sponsor a **technology literacy committee** that develops and implements a grades K-12 curriculum in the general use (“how to”) of digital electronic hardware, software, and connectivity processes.

A typical district technology committee is important but *not* fundamental to the architecture of a curriculum that features 21st Century Skills and Technology Literacy Standards. That is because it merely offers advice to educators with regard to new and improved pieces of hardware and software now available, and provides information about updated possibilities with regard to the Internet and other forms of electronic communication.

On the other hand, a technology *literacy* committee is clearly responsible for ensuring that the goals mentioned in Row 1 of the above table are implemented into the curriculum at all grade levels. While that responsibility is met very well, the previous E-hint suggests that many of today's technology literacy committees do not accept enough responsibility for the skills shown in Rows 2, 3 and 4 of the above table. It is that concern this E-hint addresses.

Reasons Why Technology Literacy Committees Sometimes Avoid Implementing All ISTE Standards

In the late 20th Century most districts began their work with technology by offering relatively simple programs in keyboarding and other technical operations, the management and application of software programs, and the use of computers to learn certain subjects and skills more efficiently. A few districts dabbled in programming but eventually dropped that function when it became clear that such a specialized skill wasn't really necessary for most students.

Today most technology literacy committees are almost overwhelmed with the rapidly changing nature of technological hardware, software, and connectivity, to the point it is difficult for them to get beyond those tangible aspects of the ISTE standards. They frequently turn to popular programs like TechSteps, which claim to be aligned with ISTE standards and are suitable for use in grades kindergarten through eight. Even with programs like TechSteps, designed to be integrated into a regular curriculum, the committees are constrained by the valid feelings of many elementary teachers that their curricula are too overloaded with tested core AYP-driven requirements to include additional elements.

There is also a perceived inability to use technology literacy to effectively enhance core courses taught at the high school level, primarily because specific curricula for those courses may not be published, well defined, or adequately used by the teachers. Consequently, most of a high school technology literacy curriculum shows up in *elective* courses in business, and career and technological education (CTE), which again tend to focus on hardware, software and connectivity skills.

How Technology Literacy Committees May Incorporate ISTE Standards into Core Curricula

The main intentional learning outcomes from ISTE are:

- demonstrate creative thinking, construct knowledge, and develop innovative products and processes using technology.
- use digital media and environments to communicate and work collaboratively, including at a distance, to support individual learning and contribute to the learning of others.
- apply digital tools to gather, evaluate, and use information.
- use critical thinking skills to plan and conduct research, manage projects, solve problems, and make informed decisions using appropriate digital tools and resources.
- understand human, cultural, and societal issues related to technology and practice legal and ethical behavior.
- demonstrate a sound understanding of technology concepts, systems, and operations.

In terms of curricular architecture, a district cannot assume that core subject area committees will incorporate any aspects of the ISTE Standards unless specifically directed to do so. Therefore, it is important for technology literacy committees to create unit outcomes for elementary grade levels and each core subject at the middle and high school levels. While the technology aspect of a course's curriculum may appear to be essentially a procedural overlay, an actual outcome with components is needed. Here is an example of what that might look like:

Unit Outcomes from Core Curricula	Corresponding and Compatible technology Literacy Unit Outcomes
Science: Students explain how the structure of the earth's system is continuously changing due to earth's physical and chemical processes, and provide concrete examples of when and where such changes occurred.	Students will apply technological tools to science concepts and applications. They will develop formulas and data sets using a spreadsheet table, use web sites for virtual labs, and use appropriate science related Internet sites. Components: 1) develop formulas and data sets using a spreadsheet table, 2) use websites for virtual labs, and 3) use appropriate science related internet sites.
Language Arts: Students apply reading and writing skills to create questions, for which answers are sought, identify different media formats, locate and record information, organize and share information, and evaluate the worth of information in terms of its relevancy.	Students will use appropriate Internet techniques to search for and establish relationships with others. They will use appropriate language arts related Internet sites, presentation software to share information, and graphic organizers. Components: 1) appropriately use valid interactive websites to acquire relevant information, 2) use traditionally correct language and newly-accepted terms on the Internet, and 3) use presentation software and graphic organizers.

As can be seen, the technology literacy outcomes support the existing core subject curricula. Each core course would probably have only one technology literacy outcome, and it might very well be a "longitudinal outcome," which means it would be completed over the course of the whole year (or semester). Core courses in social studies can easily include elements related to cultural and societal issues; in mathematics the overlay can focus on such ISTE concerns as the application of digital tools to gather, evaluate, and use information. The idea here is that merging technology literacy and 21st Century Skills with current core curricula does not require a complete overhaul of a good existing academic program. Instead, it can assertively nudge teachers toward developing and teaching a more authentic curriculum in 21st Century terms.