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4 Steps to Standards Integration

By Vanessa Domine

Aligning curriculum with technology standards can be a challenge

It is too easy for teachers and library media specialists to entangle themselves in the multiple strands of standards: State core curriculum content standards, NETS•S, NETS•T, and the Information Literacy Standards (ALA). To prevent teachers from drowning professionally in this vast sea of accountability, I found that the following exercise untangles the standards and helps teachers to align their teaching style with immediately accessible instructional technologies. I outline a curriculum design process that allows educators to visually assemble curriculum where standards are at the forefront of their teaching and where instructional technologies play a supporting role.

1 Take Inventory

The first step in this design exercise requires teachers to create a comprehensive inventory of educational media and technology at their school site. The inventory should include more than just a list of computers and software. Equally valuable instructional technologies include manipulatives, books, TVs, VCRs, overhead projectors, microphones, cameras, and audio recorders—in addition to personal digital assistants, electronic whiteboards, and tablet PCs. Consulting a district or school technology plan or even library plan (if such documents exist) is an excellent way to find out what equipment the school has as well as get familiar with the school's vision, mission, and goals.

Once the inventory is as comprehensive as possible, I encourage teachers to ask their technology coordinator or designated tech expert to assist them in categorizing the inventory list according to media format (i.e., object, print, audio-visual, multimedia). It is useful as well to classify software applications according to their general type—for example, simulation, authoring, database, drill-and-skill. It is also worthwhile for teachers to review their inventory list and ask the questions, "Which of these technologies do my students already use? And to what degree do they use them?" Interestingly, young students might use mostly cell phones, video games, and instant messaging outside the classroom and encounter completely different technologies in the classroom. This type of digital divide is an important one for teachers to notice and ultimately bridge. However, in a more immediate sense, creating a technology inventory allows teachers to:

- Locate technologies that are currently accessible at their school site and thus are real options for their teaching;
- Identify technology professional development needs; and
- Create a tangible document that will allow teachers to temporarily set aside the technology and focus on core curriculum content.

demonstration, large/small group discussion, collaboration, team-teaching, tutoring, hands-on practice, individual study, listening, brainstorming, question-and-answer, research, or media production. I then ask them to categorize this list according to those strategies that are predominantly teacher-centered and those that are primarily student-centered. Creating a list of teaching strategies allows teachers to reflect and, if necessary, revise their teaching style to accommodate specific standards and students with special needs. This is an important step, as it emphasizes the significance of how learning occurs, not just what or how content is taught. This exercise leads to important conversations about how the methods and media of instruction ultimately shape the curriculum that is enacted in the classroom environment.

Because the information literacy standards comprise a perspective or lens for core curriculum content, they serve as a bridge between specific technologies and methods of teaching. In other words, information literacy is a means to a particular curricular end, rather than itself a content goal. For example, ALA Standard 1 refers to accessing information efficiently and effectively. Students in History grades 7–8 should know different types of primary and secondary sources and the motives, interests, and bias expressed in them (e.g., eyewitness accounts, letters, diaries, artifacts, photos, magazine articles, newspaper accounts, hearsay). Similarly, the NETS•S for grades 3–5 require students to determine when technology is useful and to select the appropriate tool(s) and resources to address a variety of tasks and problems. These technical standards and skills are more appropriate to discuss after choosing a curriculum goal, as they often imply methods and specific technology resources for achieving the content goal.

2 Establish a Curriculum Goal

The second step is to create a simple curriculum goal statement. Ideally, the goal statement should be grounded in a specific content area, and align with district or school goals. These are often represented through a yearly theme or mission, such as "Caring Communities" or "Reach for the Stars," or even an immediate pressing need such as raising math test scores. At the same time, the curriculum goal should be broadly crafted (e.g., enhance students reading skills, develop students' understanding of physics).

A teacher can also derive a goal statement from specific grade-level strands of standards, such as increasing first grade students' understanding of weather. The ways of defining a goal are numerous, depending upon the degree to which teachers collaborate across disciplines and the specific needs of the school.

Once the curriculum goal is widely cast, it is essential to define it through national, state, and local curriculum standards. This is, in many ways, an interpretive exercise. One teacher chose "to increase fourth grade students' proficiency in U.S. geography," and defined it through the social studies and language arts standards, which include understanding the locations of major geographical, physical, and human characteristics of the United States and reading a variety of materials and texts, using visual information, and writing in clear language. I then ask teachers to make a list of their selected core content standards that define their overarching curriculum goal.

3 Identify Teaching Strategies

Most teachers already know how they like to teach and how they want students to learn. For the third step I ask teachers to create a list of teaching strategies that might include lecture,

Technology Integration Matrix

Standards	Strategies	Technologies

Access

Social Studies: Civics; Diversity; Cultural exchange and conflict; Summarize information in various forms; Problem solving and research skills

Technology Literacy Standard: Responsible use of online library resources.

Information Literacy Standard 1: Access information efficiently and effectively

NETS•S Standard 5: Technology research tools; all

Strategies	Technologies
Read aloud	Internet access
Problem posing	Printer
Large-group discussion	Database/Encyclopedia
Information gathering	Notepad software
Notetaking	
Small-group work	

Analyze

Social Studies: Analyze events over time; Analyze prejudice; Compare and contrast

Technology Literacy Standard 8: Use a graphic organizer

Information Literacy Standard 3: Applies info

NETS•S Standard 5: Technology research tools; Use tech to evaluate info from a variety of sources

Strategies	Technologies
Video presentation	Internet access
Q&A	Streaming video
Large-group discussion	Electronic whiteboard
Debate	Concept-mapping software
Brainstorming	
Concept mapping	

Evaluate

Social Studies: Examine current issues; Relate current events to past events; Differentiate between power & authority

Technology Literacy Standard 8: Evaluates information; Appropriate use of e-mail

Information Literacy Standard 2: Evaluates critically and competently

NETS•S Standard 6: Technology problem-solving and decision-making tools; Real-world problem solving

Strategies	Technologies
Individual writing	Internet access
Peer critique	Word processing
Developing hypertext	E-mail
Collaborative writing	

Produce

Social Studies: Organize events in a time line

Technology Literacy Standard 8.1: Solve problems collaboratively; Design and produce; Produce a multimedia project

Information Literacy Standard 3: Use information accurately and creatively; Standard 8: tools; ethical behavior

NETS•S Standard 2: Responsible use 4: technology communications, social, ethical, and human issues; Use telecommunications to collaborate

Strategies	Technologies
Nonlinear design	Printer
Storyboarding	Scanner
Multimedia production	Image editing
Peer editing	Hyperstudio
	Video editing
	E-mail/IM

Communicate

Social Studies 6: Explain American symbols; Values that continue democracy; Heritage among diversity.

Technology Literacy Standard 8.1: Communicate results in project or presentation.

Information Literacy Standard 9: Contribute positively to the learning community to pursue and generate information

NETS•S Standard 4: Technology/communication tools; Variety of forms to communicate

Strategies	Technologies
Oral/visual presentation	Internet access
Listening	LCD projector
Q & A	Microphone
Peer critique	Intranet
Discussion	

4 Solve the Equation(s)

For easy reference, I ask teachers to lay out in front of them the three lists they have created (in order from left to right): Selected curriculum standards, teaching strategies, and technology inventory. From these lists, I ask the teacher to generate a Technology Integration Matrix (See a sample matrix on page 24). Each list corresponds to each column of the matrix. The number of rows in the matrix will be determined by the timeframe for accomplishing the established goal. Whether a curriculum unit, module, or marking period, establish realistic parameters at this point. Given that the cycle of media literacy requires students to access, analyze, evaluate, produce, and communicate using various media technologies, I encourage teachers to organize the rows of the matrix according to this cycle, using each phase (e.g., access, analysis, evaluation, production, communication) as a benchmark for formalized assessment.

The anchoring points for assembling the matrix are the formalized assessments, as determined by each teacher and the realities of his or her grade level and subject area. I ask teachers to review the selected standards and determine how they will assess students. Whether a standardized test or project-based learning, or both, those points should be clearly indicated within the Strategies column. The placement of assessment(s) will then direct the placement of standards in the first column and also direct the selection of additional strategies and activities to guide students toward the assessments in the second column. The process of filling in the matrix is a recursive one, and it involves critical questions about how standards are achieved and what teaching strategies and (formalized) assessments support curriculum standards.

Finally, teachers choose from their technology inventory those items that will support each teaching strategy or a set of strategies. For example, Internet access will support a teacher demonstration as well as student research. This step clearly requires not only knowledge about how the technologies work, but also knowledge about what each technology enables and disables pedagogically. For example, the teacher's use of a presentation will visually supplement a lecture or explanation; however, the technology will not facilitate a class discussion (teachers and students do). Similarly, a student's assembly of a presentation does not display his/her research skills or ability to analyze information. It can, however, display technological proficiency and display interpretation and understanding of ideas or events. This important step of connecting the dots with technology is an important one, as it sheds light on the benefits and constraints of technologies that may dominate education—yet be of little pedagogical use.

The key to this exercise is to readily identify any gaps or misalignment of elements within each column, and then adjust accordingly. It can be thought of as creating a set of equations. Technologies in the far right column used to support each teaching strategy or method in the middle column will ultimately achieve the standards in the left column. It is during this process of alignment that teachers and media specialists often realize that the technologies and even the assessments used are misaligned with the teaching strategies and standards. In addition, they may also find that their assessments are not accurately identifying or supporting the levels of technological and information literacies indicated in the NETS and ALA standards.

This exercise is a useful anchor for inservice teachers and media specialists to experiment using new media technologies to support existing curriculum or, conversely, use traditional media technologies to support new or unfamiliar curriculum standards. Once a matrix is established for a particular goal, it provides both breadth and depth to curriculum as it holds pedagogy paramount and subordinates technology. Best of all, it positions information literacy standards and the NETS•S as turnkey tools for smarter technology integration.

Dr. Vanessa Domine is an assistant professor of educational technology at Montclair State University in New Jersey. She is the creator and director of a new master's program in Educational Technology and a certification program for school library media specialists. Her journal articles and book chapters address technology planning in urban settings and media literacy among adolescents.

Call for Curriculum Submissions

Have you or a colleague taught a lesson or unit integrating technology that went particularly well?

Do you have:
- Tips, tricks, or tidbits?
- Stories or quotes that demonstrate student learning?
- A great tech tool or resource?
- Quick ideas easily adapted to other settings or content areas?

If you answered **yes** to any one of these, please call or write the editor with your ideas:

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