Discovery EDUCATION

Learning by Design

A District Framework for Evaluating Classroom Technology

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Re-centering Classroom Technology on Learning

School boards, families, and policy makers are asking districts to ensure that classroom technology serves learning rather than displacing it. The Learning by Design Framework gives district leaders a principled, research-grounded basis for those decisions. It establishes six dimensions for evaluating whether a technology was built to enable learning through distinct instructional practices that rely on technology and cannot easily be replicated with print materials or offline activities.

This framework supports local screen time policies by giving decision-makers the confidence that every adoption has earned its place in instruction.

Understanding Device Profiles

Not all classroom technology involves individual student devices. Before evaluating any edtech tool, identify which user profile applies. The implications for screen-time, teacher oversight, and student experience differ meaningfully between them.

Teacher-Directed Display Use	Guided Student Device Use
The educator uses a digital resource on a shared screen as part of whole-class instruction. Students engage cognitively with the content on the display. Individual student devices are not required. The screen time here aligns to the teacher's instructional intent and delivery.	Students interact with a tool individually or in small groups for a defined, teacher-directed session with a specific learning purpose. Activities enable experiences that could not easily be replaced by print, and are assigned, bounded in time, and connected to a learning objective.

Both profiles can reflect intentional use. This framework applies to both, with notes on how each dimension applies differently by use case.

- **Dimension 1: Learning Intent**
- **Dimension 2: Teacher Agency**
- **Dimension 3: Research Foundation**
- **Dimension 4: Bounded by Design**
- **Dimension 5: Active Learning Design**
- **Dimension 6: Instructional Insight**

DIMENSION 1

LEARNING INTENT

Guiding question: *Does every feature and interaction serve a defined learning objective?*

Technology earns its place in a lesson when its presence connects to a specific learning goal and standard. Tools designed with learning intent are built around curriculum outcomes, not general engagement. Both educators and students should understand the purpose of any technology interaction in a lesson.

Learning intent is not something a teacher adds by deploying a tool thoughtfully. It should be embedded in the product's architecture: every feature exists because it serves a defined learning purpose. The experience is designed to minimize off-task pathways and keep students focused on the intended learning objective.

Teacher-Directed Display Use	Guided Student Device Use
The digital resource is selected because it does something specific in service of the lesson objective. This could be building background knowledge, modeling a concept, or providing a shared reference point. The teacher can articulate the learning purpose of each element.	Each student interaction connects to a skill, concept, or standard being developed. The product's design minimizes potential for off-task activity. Students can articulate the learning focus of the activity, not just complete the task.

DIMENSION 2

TEACHER AGENCY

Guiding question: *Does the educator control when, how, and for how long technology is used?*

Classroom technology should support teacher authority wholly. This means educators control when technology enters the lesson, what students access, how long a session runs, and how the tool supports different learners. Teacher agency should be built into the product's design. The default experience should maximize learning opportunities for students and empower educators to make adjustments to ensure equitable access as needed. A product that requires a teacher to disable standard features or override settings to maintain instructional control has been designed with teacher agency in mind.

Teacher-Directed Display Use	Guided Student Device Use
The teacher is the only person interacting with the technology directly. Students engage through the content on the display. The educator controls pace, pause, and purpose entirely. The tool responds to teacher direction, not the other way around.	The teacher can assign, monitor, pause, and close student sessions in real time. The tool provides meaningful visibility into what each student is doing. Differentiation and access controls are accessible without significant technical effort.

DIMENSION 3

RESEARCH FOUNDATION

Guiding question: *Is the tool designed using established learning science, and is there evidence it produces learning gains?*

This dimension has two complementary tiers. At minimum, a classroom-ready tool should be explicitly designed around named, established instructional principles that are grounded in what research tells us about how students learn: active processing, spaced retrieval practice, formative feedback, the relationship between background knowledge and reading comprehension, and the conditions under which multimedia supports rather than replaces understanding. Vendors should be able to cite specific, research-backed principles that tools are built on.

Where available, independent outcome research strengthens confidence and guides implementation, especially for student-facing, device-dependent tools used repeatedly over time. Design grounding and outcome evidence are distinct. A well-designed tool may not yet have a full body of independent research, while a tool with a funded efficacy study may not have been designed around rigorous principles. Districts should ask vendors to address both dimensions specifically.

Teacher-Directed Display Use	Guided Student Device Use
For teacher-directed tools, districts should ask which specific learning science principles shaped the design and what evidence exists that student engagement with this content produces stronger learning outcomes than comparable instruction without it.	For student-facing tools, districts should look for independent research demonstrating measurable learning gains in specific skills and grade levels, with credible methodology.

DIMENSION 4

BOUNDED BY DESIGN

Guiding question: *Does the tool have natural stopping points, and is it free of mechanics that encourage use beyond its learning purpose?*

Technology designed for classroom learning should have structural stopping points built in as a lesson ends or a teacher closes the experience. The product's design should make it natural to stop, not difficult.

Features that borrow mechanics from social media and consumer gaming, such as variable reward loops, streaks that penalize students for stopping, infinite content queues, push notifications, and social comparison features are optimized for time-on-screen, not learning. Those mechanics have no place in a classroom-ready tool, regardless of the quality of the underlying content.

Teacher-Directed Display Use	Guided Student Device Use
The teacher controls the start and end of the experience entirely. The tool does not generate pressure on students to continue using it beyond the lesson. There are no notifications, rewards for continued access, or other mechanics that operate outside the teacher's session.	Sessions have defined endpoints aligned to instructional goals, even when learning progress continues over time. Students are not left with open-ended access after their assigned task is complete.

DIMENSION 5

ACTIVE LEARNING DESIGN

Guiding question: *Are students doing meaningful cognitive work through learning experiences that are genuinely not possible without the technology?*

Active learning design has two dimensions, and both are required for a tool to pass this dimension. First, the tool requires cognitive effort from students, not passive consumption. Learning is built on active retrieval, elaborative processing, and formative feedback. A student completing a task in a well-designed tool should be thinking, deciding, producing, or responding—not clicking through screens. Passively watching or reading content without structured engagement fails this standard.

Second, when individual student devices are involved, the technology should enable learning experiences that are meaningfully enhanced or genuinely only possible through digital interaction. For example, simulations of chemical reactions or physical phenomena that cannot be safely or practically recreated in a classroom. Adaptive pathways that respond to each student's current learning state in real time. Interactive models at scales—molecular, geological, astronomical—impossible to reproduce physically. If a device-dependent activity could be accomplished equally well with a book, a discussion, or a physical manipulative, the device has not earned its place. This is not a criticism of print-based or discussion-based learning—it is a standard for when technology is worth adding.

Teacher-Directed Display Use	Guided Student Device Use
The content on the shared display does something that print or verbal explanation alone cannot, such as building schema through visual media, modeling a concept through animation, providing access to primary sources, or making abstract phenomena concrete. The teacher can articulate what the technology adds that a handout could not.	Student interactions require thinking, deciding, producing, or responding. The use of a student device enables learning that would otherwise be impractical or impossible in a classroom setting.

DIMENSION 6

INSTRUCTIONAL INSIGHT

Guiding question: *Does the tool help teachers understand what students are learning and adjust their instruction accordingly?*

Technology in the classroom should make teaching more informed. A tool that generates real-time, actionable data by student and skill closes the feedback loop between student activity and instructional decision-making.

Usage data alone (time on task, completion rates, login frequency) represents student effort, but it does not provide the instructional insight educators need. The most useful data tells a teacher what a student understands, where they are struggling, and what instructional response to offer next.

Teacher-Directed Display Use

For teacher-directed tools, built-in real-time data is not expected. The screen belongs to the teacher's delivery. What matters is whether the lesson design includes connected assessments or discussion protocols that generate evidence of learning from what was on the shared display.

Guided Student Device Use

The teacher dashboard provides real-time visibility into student progress. Data surfaces what students know and where they are struggling, not only what they completed. The data is actionable without requiring significant interpretation or a data analyst to read it.

Applying the Framework

A tool that meets these six dimensions was designed to earn its place in the classroom. It is built on learning science, structured for teacher control, bounded in time, active in engagement, and transparent in its impact. Applying this framework consistently helps districts distinguish technology that serves learning from technology that simply adds screens to the school day.