RESEARCH BRIEF

THE DIGITAL DIVIDE: TECHNOLOGY INTEGRATION IN SCHOOL DISTRICTS

K-12 EDUCATION

Hanover Research highlights steps for integrating technology into daily learning and instruction.

HANOVER RESEARCH

INTRODUCTION

Technology is integral to developing students' 21st-century skills, and digital learning has become nearly ubiquitous in U.S. classrooms. Public schools now provide at least one device for every five students, spending upwards of $3 billion on digital content annually. Many teachers, however, remain slow to integrate technology in ways that truly transform their practice and improve students' learning and achievement. The U.S. Department of Education identifies a growing "digital use divide," which separates students who use technology in active ways—i.e., using technology to transform their learning—and students who use technology passively—i.e., relying on technology to simply consume content or to replace paper-based activities such as quizzes or reading assignments.

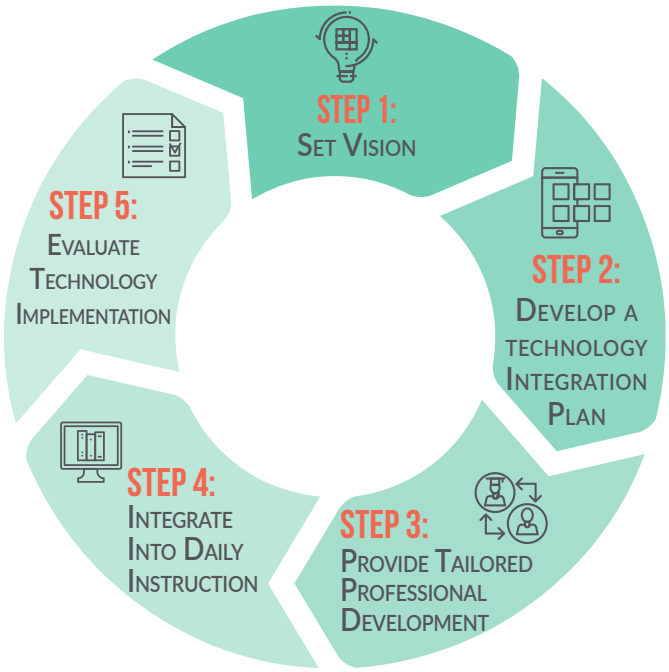
Educational technologies have improved achievement outcomes for only a limited number of students, in part due to the challenges educators face when attempting to integrate technology into daily learning. Although districts continue to invest in devices and technology infrastructure, many teachers remain unprepared to use technology to effectively leverage digital content and transform daily instruction. Moreover, leaders often lack the support and tools needed to guide and evaluate effective technology use.

To address these challenges and close the digital use divide, districts and schools must acknowledge the adoption of specific technologies is insufficient to improve outcomes for many students. Rather, educators must adopt and implement technologies in ways that intentionally support and improve student learning. This research brief summarizes key steps that district and school leaders can take to integrate technology more effectively into daily instruction and learning.

I. TECHNOLOGY INTEGRATION PROCESS

Effective district-wide technology integration relies on strong district and school leadership. District and school leaders school empower stakeholders at all levels to take risks, provide input, and take ownership of technology integration efforts. The following multi-step, cyclical process should guide district- and school-wide technology integration efforts:

TECHNOLOGY INTEGRATION PROCESS

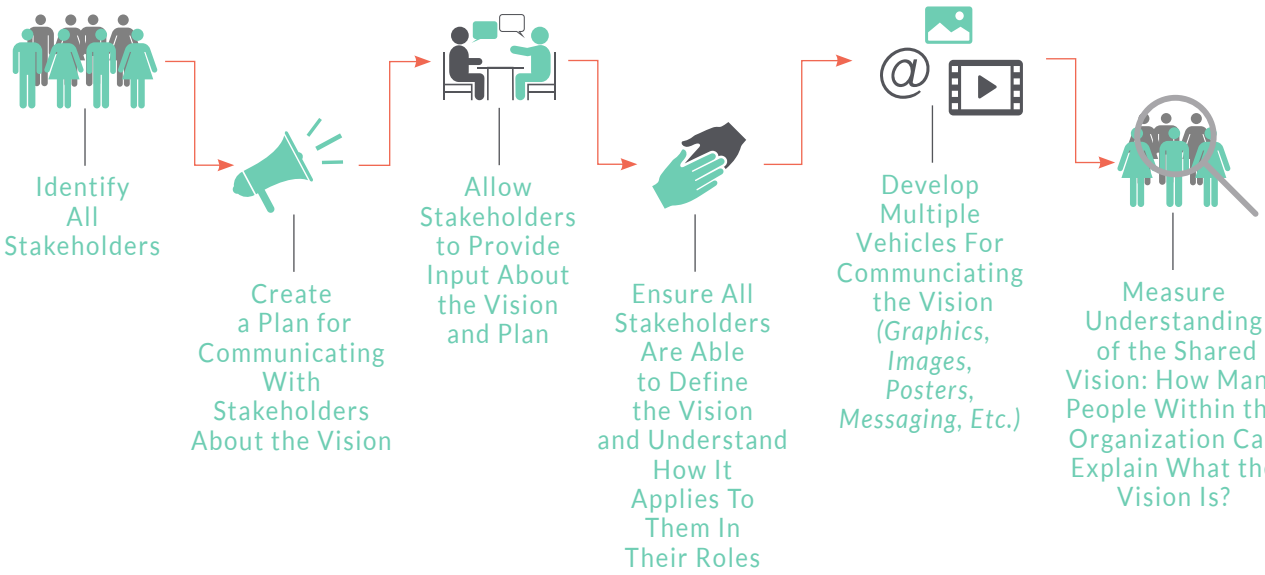


STEP 1: SET VISION

District and school leaders must first establish a system-wide vision around educational technology use that will guide all subsequent planning and integration efforts. Leaders should avoid taking a top-down approach and instead work to develop a shared vision that incorporates the voices, goals and feedback of educators, support staff, students, parents, and other community members.

Leaders can take the following steps to develop a shared vision around educational technology use:

EDUCATIONAL TECHNOLOGY VISION DEVELOPMENT



SAMPLE VISION STATEMENT: MESA VIEW ELEMENTARY SCHOOL *(ARIZONA)*

With the understanding that the use of technology will be an integral part of our students' lives, it is Mesa View Elementary School's responsibility to prepare students for this future. Our classrooms must have the equipment, technology, and technical support to allow teachers to use technology in their everyday lessons. As we integrate technology, we will support the teaching and learning that promotes intellectual growth and lifelong learning for students and staff.

STEP 2: DEVELOP A TECHNOLOGY INTEGRATION PLAN

After formalizing a vision around educational technology use, district leaders should develop a plan for integrating technology to meet organizational goals. A technology integration plan should align with the district's vision for technology use and describe how various technologies will be adopted and rolled out. The plan should address all aspects of technology integration, from infrastructure to ongoing evaluation. Key components of an implementation plan include:

1. Short-and long-term goals;
2. **A roadmap** explaining how these goals will be accomplished;
3. Timelines and key milestones; and
4. **A description of how the district will divide responsibilities and resources** *(e.g., staff, funding, and time).*

Districts can use needs assessments to inform the planning process. Needs assessments can help districts determine current levels of technology integration, identify gaps in existing resources, and determine stakeholders' readiness for using new technologies. The figure below lists key questions to ask when conducting an initial needs assessment:

KEY QUESTIONS TO ASK WHEN CONDUCTING NEEDS ASSESSMENT

EDUCATORS

- Does the district have data on teacher technology literacy skills and comfort with using technology while teaching?
- What professional development opportunities related to technology have teachers availed themselves of over the past two years?
- Are teachers comfortable with leveraging the technology tools to help meet individual student needs?

STUDENTS

- How are students performing against standards and benchmarks on various assessments?
- How prepared are students to use digital learning tools seamlessly in the classroom?
- What are the plans for new students as related to technology literacy and familiarity with the devices and tools?

INFORMATION TECHNOLOGY TEAM

- Does the district have a thorough inventory of devices?
- How are the devices deployed within each school?
- How has the district planned for long-term sustainability?

ACCESS TO TOOLS AND CONTENT

- What education technology tools are currently available to enhance education for all students?
- How has digital content already been incorporated into the curriculum?
- What technology resources could be obtained through procurement opportunities at the district?

Source: State Educational Technology Directors Association.

STEP 3: PROVIDE TAILORED PROFESSIONAL DEVELOPMENT

Professional development should begin six months to a year ahead of implementation of new initiatives *(e.g., the roll-out of a new 1:1 device program)*. This provides enough time for teachers and staff to become familiar with the capabilities of the new devices, technology *(i.e., software)*, and digital learning opportunities before students receive their own devices. After introducing new technologies, school and district leaders should continue to provide frequent and ongoing professional learning opportunities to support teachers in integrating technology effectively, as many teachers struggle to adapt their pedagogy and curricula in ways that leverage technology to transform student learning.

Professional development opportunities should include collaborative forms of learning, such as coaching and professional learning communities, and reflect educators' learning needs. Training may focus on both technical aspects of technology use *(e.g., how to access the school's network or how to regulate device use in the classroom)* as well as practices for using technology to personalize and improve instruction.

STEP 4: INTEGRATION INTO DAILY INSTRUCTION

Educators should integrate technologies in ways that have a meaningful impact on student learning. When teachers use new technologies merely to replace less modern tools *(e.g., having students write an essay on a laptop instead of with pencil and paper)*, they fail to use technology to transform and personalize student learning.

A technology integration framework can help teachers to assess and guide technology use in the classroom. The SAMR model—which stands for Substitution, Augmentation, Modification, and Redefinition—is a commonly used model that envisions technology integration as a series of four steps. The ultimate goal is to redefine learning by using technology to complete tasks or projects that were previously not possible.

SAMR FRAMEWORK DESCRIPTION

SUBSTITUTION (Transformation Part I)	The technology provides a substitute for other learning activities but without functional improvements. *For example, a word processor is used like a typewriter.*
AUGMENTATION (Transformation Part II)	The technology provides a substitute for other learning activities but with functional improvements. *For example, students use basic functions of a word processor such as cut and paste and spellchecking.*
MODIFICATION (Enhancement Part I)	The technology allows the learning activity to be redesigned. This could involve increased student collaboration through email, shared documents, and other cloud-based programs. *For example, students use basic functions of a word processor such as cut and paste and spellchecking.*
REDEFINITION (Enhancement Part II)	The technology allows for the creation of tasks that could not have been done without the use of technology. *For example, students are able to collaborate with professionals or experts over the web, create multimedia projects, integrate a variety of online sources, and provide real-time peer feedback.*

STEP 5: EVALUATE TECHNOLOGY INTEGRATION

Educators should integrate technologies in ways that have a meaningful impact on student learning. District and school leaders should conduct ongoing evaluations to gauge whether technology integration has improved teaching and learning. Leaders should assess the effectiveness of specific technologies, as well as teachers' abilities to integrate technology in ways that support and enhance daily learning. To gauge integration success, districts should engage in two types of evaluation: formative and summative.

Formative evaluations measure short-term outputs and outcomes associated with how well a program is implemented as intended. Districts can analyze data from program documents, stakeholder surveys, observations, or interviews to gauge initial implementation from the following outcomes:

- Stakeholder understanding of the district vision for technology use
- Creation of necessary technological infrastructures
- Completion of implementation activities within the intended timeframe
- Provision of professional development and training

Summative evaluations focus on the effects of a program or initiative on the intended beneficiaries. Summative evaluations for technology integration can focus on outcomes such as:

- Changes in teachers' instructional practices or classroom activities
- Student engagement outcomes
- Measures of student learning such as test scores, grades, or ability to use technology to complete complex assignments

School and district leaders can use **logic models** to design evaluations and to understand the relationship between program activities and the intended results of these activities. Logic models can also help all stakeholders understand the short- and long-term outcomes of technology integration.

LOGIC MODELS FOR EVALUATION PLANNING

INPUTS

Inputs are:
All human, financial, community, or organization resources that are directly used for a program.

ACTIVITIES

Activities are:
How the program uses the inputs/what the program does with the inputs.

OUTPUTS

Outputs are:
Direct, measurable results of a program.

SHORT-TERM OUTCOMES

Short-term outcomes are:
Specific changes in participants' behavior, skills, actions, etc. that occur within one to three years.

LONG-TERM OUTCOMES

Long-term outcomes are:
Fundamental changes within an organization or a community.

II. DIAGNOSTIC: 21ST-CENTURY DIGITAL LEARNING MODEL ASSESSMENT

The 21st-Century Digital Learning Model Assessment guides district and school leaders in assessing district or school progress toward a digital age learning model characterized by personalized, competency-based learning that leverages digital content to extend learning beyond the classroom.

ON A SCALE OF 1 TO 5, HOW WELL DO YOU FEEL YOUR DISTRICT ALIGNS TO THE IDEAL 21ST-CENTURY DIGITAL LEARNING MODEL?

TRADITIONAL INSTRUCTIONAL MODEL		CIRCLE THE NUMBER THAT BEST FITS YOUR DISTRICT:		21ST-CENTURY DIGITAL LEARNING MODEL
One-size-fits-all instruction and instructional resources	Strongly Traditional	1 2 3 4 5	Strongly 21st-Century	**Personalized learning** and flexible resources optimized for each student
Advancement based primarily on **time spent in class**	Strongly Traditional	1 2 3 4 5	Strongly 21st-Century	Advancement based on demonstrated **mastery of content and competency** in applying what has been learned
Fixed places and times for learning within school buildings	Strongly Traditional	1 2 3 4 5	Strongly 21st-Century	**Anywhere and anytime learning**, inside and outside schools, 24/7, with most learning blend in face-to-face and online activities
Teacher-centered instruction, with teachers as expert disseminators of content to classes of students	Strongly Traditional	1 2 3 4 5	Strongly 21st-Century	**Student-centered instruction**, combining large group, small group, and individualized learning with teachers serving as facilitators
Printed, static text, often out-of-date, as the dominant content medium for educational resources	Strongly Traditional	1 2 3 4 5	Strongly 21st-Century	**Digital content** providing interactive, flexible, and easily updated educational resources
End-of-course standardized assessments of learning, primarily for accountability	Strongly Traditional	1 2 3 4 5	Strongly 21st-Century	**Assessments integrated into learning activities** to provide ongoing information about students' achievement that can be used to improve teaching and learning
Academics addressed in isolation, with **schooling separated from informal learning experiences outside of school**	Strongly Traditional	1 2 3 4 5	Strongly 21st-Century	**Project-based** and **community-based** learning activities connecting to students' lives outside of school

Source: William & Ida Friday Institute for Educational.

If you circled **3 OR LESS ON ANY ITEM**, reach out to **info@hanoverresearch.com** to learn how Hanover can help your district fully implement a 21st-Century Digital Learning model to maximize student outcomes and manage costs.

SOURCE LIST

INTRODUCTION

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I. TECHNOLOGY INTEGRATION PROCESS

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Contributions to this publication were made by the following Hanoverians:

Chief Content Officer: Anil Prahlad

Project Leads: Leila Nuland, Sarah Van Duyn

Contributors: Laura Baker, Anthony Guadagni

Editorial Team: Amanda Lockhart, Jamal Russell-Black, Jordan Wells

Designed by: Johanna Mora

ABOUT HANOVER RESEARCH

Hanover Research provides high-quality, custom research and analytics through a cost effective model that helps clients make informed decisions, identify and seize opportunities, and heighten their effectiveness.

THE HANOVER APPROACH TO TECHNOLOGY INTEGRATION

Hanover Research offers an integrated and customized approach to evaluating educational technology. The issue of technology integration is unique to each K-12 organization, and Hanover's team of experts will recommend a tailored approach best suited for the individual organization. Hanover's unique year-long partnership model allows for each technology integration project to build off of the previous one, producing more actionable results and more detailed insights.

HANOVER'S CORE CAPABILITIES

PRIMARY RESEARCH

Survey design, administration, and analysis; qualitative data coding; in-depth interviews; online and onsite focus groups; digital ethnography

SECONDARY RESEARCH

Literature review; best practices; environmental scan; benchmarking; demographic analysis

DATA ANALYSIS

Descriptive and predictive analytics, including: student segmentation; linear regression; data mining; decision simulation; data visualization

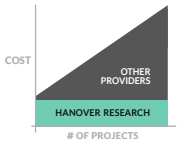
HANOVER'S MODEL DIFFERENTIATORS

EXPERT

Nearly 200 analysts with advanced research knowledge

CUSTOM

Every report tailored to meet a client's unique needs



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CONTACT

www.hanoverresearch.com
P 202.559.0050
E info@hanoverresearch.com