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Powering K-12

digital transformation

The 7 factors to achieving real innovation
in schools

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Digital transformation requires several factors working together to be successful. Focusing on the technology alone won't result in real, systemic change.

Digital transformation is the integration of technology throughout all areas of education to fundamentally alter teaching, learning and school operations.

It's not tinkering around the edges. It's making wholesale changes to the entire organization to drive systemic change. And it's not just improving on old processes. It's reimagining these to deliver more value to students and other stakeholders in ways we couldn't envision just a generation ago.

In school systems that have undergone a digital transformation, every student has access to a mobile device for learning and creating. Learning is student-driven, inquiry-based and collaborative. Students use technology to connect with peers and experts all over the world, research and solve problems, produce sophisticated works to demonstrate their learning and share their knowledge with a global audience.

In forward-thinking districts, technology has also transformed daily operations. Educators are using data to gain deeper insight into students' precise learning needs. Administrators are using smart building infrastructure to manage facilities more effectively. Parents are using digital platforms to communicate with educators and follow their child's progress.

Districts that have experienced a digital transformation were well prepared for shifting to remote instruction in response to the COVID-19 pandemic. A successful digital transformation enables true anytime, anywhere learning to occur, with students able to learn, create and collaborate whether they're working in person or online.

But none of these changes happens in a vacuum. Most importantly — and this is where many districts err — technology is only one piece of the puzzle. Digital transformation requires several factors working together to be successful. Focusing on the technology alone won't result in real, systemic change.

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Seven key elements of digital transformation

Here are seven factors, which all work in conjunction, that are critical to the success of any digital transformation initiative.

1. Vision

You can't arrive at your destination without a clear understanding of where that is. Ideally, your vision should be collaborative, formed with input from all stakeholder groups. It should articulate what teaching, learning and daily operations should look like and the specific changes technology will enable. Begin with the outcomes you hope to achieve, and build your vision around the practices that will help you achieve them.

2. Leadership

Strong leadership is needed to communicate the district's vision and get stakeholders to buy in. Effective leaders set the agenda and keep the digital transformation moving forward. They maintain staff focus on the initiative's goals and ensure that budgets and other resources are aligned to make these a reality.

3. Policy

School systems can't change processes and systems without establishing new rules that allow these practices to flourish. Think about how you'll ensure digital equity and student safety: Will you let students bring their own devices to school? Take school-issued devices home? What policies will you put in place to encourage responsible technology use, safeguard privacy, maintain data security and keep students safe online?

4. Funding

Sustaining a digital transformation requires stable, long-term funding. A common mistake that many districts make is failing to secure adequate funding beyond their initial investment in technology. Districts need to budget for ongoing maintenance, training and support, as well as regular equipment refresh cycles.

5. Professional development

Simply giving students a digital device won't change instructional practices. Educators need training, mentoring and support to help students take advantage of technology's potential. They need time to learn and explore new digital tools, hands-on coaching and ongoing support from peer networks. One-off workshops, with no follow-through to build on or reinforce this instruction, aren't enough to make a difference.

6. Change management

Changing old habits can be hard. Even if educators buy into the reasoning behind a digital transformation, they might feel an emotional attachment to the practices of the past. They might feel overwhelmed. They might resist giving up some control in their classroom. They could be nervous about making mistakes or looking foolish in front of their students who are digital natives. Effective leaders use proven change management strategies to help faculty transform their practices, with structured support and opportunities for educators to experience small wins that build their confidence and lead to further change.

At its core, digital transformation is about the changes enabled by technology.

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7. Technology

At its core, digital transformation is about the changes enabled by technology. It's not about the technology itself. Yet, technology is obviously essential to the equation. It's what makes these changes possible.

In the following pages, we'll examine the technologies needed to power a digital transformation initiative.

Technologies that drive innovation

Just as these seven elements must work together to support change, the technologies that power a digital transformation must work in concert to drive innovation. Here are six essential technologies at the heart of any successful digital transformation initiative.

Devices

Putting a device in every student's hands opens a world of possibilities. It connects students to a wealth of knowledge, empowers them to take charge of their own education and extends learning well beyond the classroom walls.

The type of device you buy for students — a laptop, tablet or hybrid device — should depend on how students will use it for learning and creating. If students will be doing a lot of writing, they should have access to a keyboard instead of tapping on a screen. Make sure the device you choose has a long enough battery life to get students through the school day, and make sure it's rugged enough to withstand abuse. Consider not only the cost of the device and whether it has enough memory and processing speed for the activities students will be using it for, but also factors such as portability and boot-up time.

Think, too, about how you'll roll out devices to students. Starting small, such as with a single grade level, and building upon that to give you a better chance of success. Make sure you provide equitable access to devices, and consider having extra on hand so that students can borrow a device if theirs is lost, stolen or damaged.

Content

Devices are powerful tools for accessing information, collaborating and creating new content, but students also need access to high-quality learning materials.

Whether these are commercial software programs or lessons that educators have created from open online content, the instructional materials that students use should be aligned with rigorous learning standards. They should also be interactive instead of just providing one-way instruction; otherwise, all you've done is replace a teacher's lecture with a digital resource.

Many content providers are building artificial intelligence (AI) and machine learning technologies into their products to create highly personalized learning paths for students. These adaptive software programs can very quickly identify the gaps in students' understanding and deliver precisely targeted instruction to fill these gaps. As you invest in content, consider how AI and machine learning can support educators in personalizing instruction.
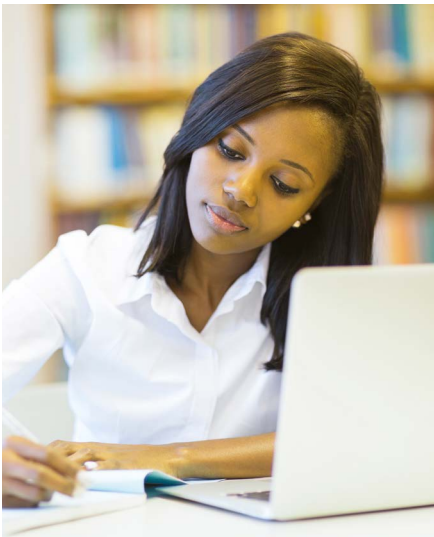
Digital tools and platforms

A learning management system (LMS) can serve as the central hub for digital teaching and learning in a school system, making it easy for educators to assign content and manage instruction. Students will also need apps, tools and platforms for connecting and collaborating with their peers online, creating original work and publishing their work for a global audience. And educators will need tools for giving feedback to students, assessing their learning and presenting information in visually powerful ways.

For instance, technologies such as augmented and virtual reality can help bring abstract concepts to life for students. Augmented reality layers computer-generated enhancements on top of existing reality, whereas virtual reality fully immerses students in a computer-generated environment. Both technologies allow students to experience places and phenomena that would be impractical or impossible for them to visit in the real world — such as touring the surface of Mars or exploring the ocean floor.

When acquiring digital content, tools and platforms, consider whether you want to host these technologies yourself or access them through the cloud. While there are advantages and challenges associated with either model, school systems that have moved key applications to the cloud found they were well positioned for a shift to remote learning amid the coronavirus threat.

Connectivity

A digital transformation can quickly falter if there isn't enough bandwidth to support it. Educators and students will stop using technology altogether if they have to wait for content to load.

Many school systems have found that their connectivity needs multiply exponentially when they commit to a digital transformation. This is consistent with Nielsen's Law of Internet Bandwidth, which states that a high-end user's bandwidth needs grow by about 50 percent each year — meaning they more than double every two years.[1]

In the third edition of its "Broadband Imperative" report, released in fall 2019, the State Educational Technology Directors Association (SETDA) recommends that school systems have the following bandwidth capacity by the 2023-24 school year.[2]

SETDA recommends at least 10 Gbps per 1,000 users for wide area network (WAN) access.[4]

- **Small districts (under 1,000 students):** At least 2.8 Mbps per user, with a minimum of 300 Mbps per district.

- **Medium-sized districts (1,000 to 10,000 students):** At least 2 Mbps per user.

- **Large districts (more than 10,000 students):** At least 1.4 Mbps per user.

Network infrastructure

Bandwidth alone isn't enough. School systems also need secure, reliable, high-speed networks to transmit all of the data used by students and staff. SETDA recommends at least 10 Gbps per 1,000 users for wide area network (WAN) access.[3] WANs should be designed with network redundancy to enable resiliency, so learning isn't impacted by a network disruption event or equipment failure.

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Security

The number of cyberattacks on K-12 schools tripled from 2018 to 2019.[5] The K-12 Cybersecurity Resource Center counted nearly 350 publicly disclosed attacks on schools in 2019, an indication of how serious an issue cybersecurity has become for education. Any digital transformation initiative should have safeguards in place to protect the integrity of student and staff information.

The cybersecurity measures you adopt should include a unified threat management (UTM) firewall, which creates a critical point of defense for school networks using multiple security strategies, as well as intrusion detection and prevention technologies. Consider investing in a distributed denial of service (DDoS) threat protection system as well, which provides advanced visibility into network activity and rapid response to volumetric DDoS threats in real time.

An experienced IT partner can help

Leading a digital transformation is fully possible, but it isn't easy. There are a lot of moving parts to account for, and each has to be in synch with the others.

An experienced K-12 technology provider can help. A provider with a proven record of supporting digital transformation in schools can guide you through every step in the process. With a technology partner who is wholly invested in your success, you're not alone on your journey.

Ideally, the partner you choose should be able to help with your network, security and connectivity needs. A single-source technology provider adds simplicity, efficiency and value to your digital transformation project.

When a K-12 digital transformation is successful, learning improves in powerful ways that benefit all stakeholders. Students explore content more deeply and learn critical 21st century skills, educators are able to help students reach their full potential, administrators can run their schools more effectively and parents feel more connected to their child's education.

Learn how Spectrum Enterprise can help with your digital transformation at enterprise.spectrum.com/education.

1. Nielsen, Jakob, "Nielsen's Law of Internet Bandwidth," Nielsen Norman Group, September 27, 2019, https://www.nngroup.com/articles/law-of-bandwidth/.

2. "Broadband Imperative III: Driving Connectivity, Access and Student Success," SETDA, November 2019, https://www.setda.org/wp-content/uploads/2019/11/SETDA_Broadband-Imperative-III_110519.pdf.

3. Ibid.

4. Ibid.

5. Klein, Alyson. "Cyber Attacks on Schools Tripled in 2019, Report Finds." Education Week, March 2, 2020, http://blogs.edweek.org/edweek/DigitalEducation/2020/03/cyber_attacks_on_schools_tripl.html.

About Spectrum Enterprise

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