



Indicator: All students receive adequate, up-to-date, equitable access to technology. (6828)

Explanation: Establishing a process to select and acquire instructional technology requires strong leadership and careful consideration of the types of devices to purchase given the degree of broadband access, available budget, student needs, equity, and device use policies. In addition, schools must consider the appropriateness and quality of instructional technology, and evaluate the degree to which online curricula are aligned with standards and objectives. Schools and/or districts should implement a process that includes developing a technology needs assessment and instructional technology plan, providing training and support to use technological tools and programs effectively, and educating stakeholders about safe and responsible technology use.

Questions: *Does your school have an instructional technology plan? Has a needs assessment been conducted to determine instructional technology needs and selection? What gaps exist and how can the school increase access to the up-to-date tools necessary for high quality instruction? What is the level of device and broadband access students experience at home? What types of instructional teams should select digital tools, and are these teams familiar with how to select appropriate technology and online curricula? What level of broadband access is ideal for digital tool use in schools and in students' homes? How many devices are ideal for student learning? How can bring-your-own device policies enhance digital learning, and what are the equity problems of these types of policies? Is teacher technology professional development personalized, sustained, and job-embedded? Do all stakeholders (including parents) participate in appropriate technology training? How can the school take steps to educate the community about safe and responsible technology use?*

Instructional transformation requires system-wide changes in classroom instruction, including the implementation of evidence-based instructional practices (Anderson, Leithwood, & Strauss, 2010; Hamilton et al., 2009; The Center on School Turnaround, 2017). A good deal of research evidence has supported the use of technologies to increase student achievement (e.g., Belland, Walker, Kim, & Lefler, 2017; Kulik & Fletcher, 2016; Tamin, Bernard, Borokhovski, Abrami, & Schmid, 2011). Recent preliminary research also suggests that instructional practices that incorporate technology and online curricula, when implemented with fidelity, may result in positive and large student achievement gains, particularly for students behind academically (Greaves, Hayes, Wilson, Gielniak, & Peterson, 2012; Pane, Steiner, Baird, & Hamilton, 2015). In fact, many schools now require students to be able to create, communicate, and learn using digital tools (National Governors Association Center for Best Practices & Council of Chief State School Officers, 2010). The recent U.S. ConnectED initiative was designed to enrich K-12 education by connecting 99% of students with broadband, high speed internet access in their schools, and empower teachers with training and technology that allows them to keep up with continually changing professional and technological demands (U.S. Department of Education, 2016). While broadband access in schools has increased substantially, many students lack device access at home, limiting their access to learning opportunities outside the school and potentially creating difficulties with homework completion (Consortium for School Networking, 2019). Schools must provide equitable access to the

adequate and current technology necessary to address their learning needs (Grant & Basye, 2014; Thigpen, 2014).

What should schools consider when selecting and acquiring instructional technology?

School leaders must organize instructional technology teams in which teachers (and others where appropriate, e.g., media specialists, students, parents, etc.) are tasked with selecting digital tools; this process can help increase the effectiveness of implementation as well as ensure crucial teacher, student, and parent buy-in (Overbay, Mollette, & Vasu, 2011; Grant & Basye, 2014). This process includes considering a variety of factors, which are described below.

Broadband access. It is critical that teachers and students have fast and reliable Internet access in order to use a wide range of digital tools, including learning and content management systems, video streaming, social networks, cloud capabilities, and online communication and videoconferencing tools (Thigpen, 2014). Approximately one-quarter of schools still lack sufficient broadband to take advantage of modern digital tools to promote learning, particularly those in rural areas (Education Superhighway, 2015); similarly, many homes lack high speed connectivity, leaving many children, particularly those in low-income, non-white, and rural communities, without the capacity to use digital tools for homework and school projects (Thigpen, 2014). While recent federal initiatives have addressed broadband inequities and narrowed the gap in access, many schools still need to consider both school and home broadband access when selecting digital technologies to ensure that they will be usable in both settings.

Number of devices to purchase and device use policies. School leaders must also consider how many digital devices to purchase and policies for their use. Recent literature suggests that a one-to-one ratio of devices to students combined with effective implementation is likely ideal for improving student outcomes. For example, a recent meta-analysis of research on one-to-one laptop programs found these programs, when well-integrated with curricula and with plenty of professional development for teachers, led to increased achievement, enhanced student engagement and enthusiasm, and more student-centered and project-based instruction (Zheng, Warschauer, Lin, & Chang, 2016). However, schools must

consider whether there is sufficient funding to pay for devices, enough bandwidth to support all students using their devices simultaneously, and how to distribute and manage so many devices (Herold, 2016). Some schools have implemented “bring your own device” (BYOD) policies to allow and encourage students to use their personal digital devices for learning at school. Schools implementing BYOD policies need strong leadership and substantial planning in order to avoid potential pitfalls that can arise with these policies. Some examples include inequity (some students’ families may not be able to afford a device for their children), student distractions that can inhibit learning, lack of security features to secure student data, and students using a range of different devices with different capabilities, which can cause an instructional burden for teachers (U.S. Department of Education, 2016).

Appropriateness and quality of digital tools and online curricula. There are an ever-increasing variety of digital tools available to teachers and schools to enhance classroom instruction and learning. Prior to making a decision to use a digital tool to teach a lesson, teachers and instructional teams must first consider the learning goals, activities, and formative and summative assessments that will make up the lesson; the selection of digital tools should follow naturally from other instructional planning decisions rather than serving as the *focus* of instruction (Hobgood & Ormsby, 2011; Leimbach, 2015). Online curricula and technologies must be aligned with national, state, or local standards, with clearly stated and measureable goals that describe what students will be able to know or do at the end of instruction (Worthen & Patrick, 2015). Rubrics are now available to assist educators with selecting online curricula that are standards-aligned and demonstrate positive impacts to student learning. For example, Achieve’s EQuIP Project provides rubrics that ask teachers to consider the extent to which the lesson or curriculum unit “elicits direct, observable evidence of the degree to which a student can independently demonstrate the major targeted grade-level CCSS standards” (Achieve, 2016). Training modules provide teachers and professional learning communities with the skills needed for using the rubrics.

What processes should school leaders use to select and implement instructional technology effectively?

In addition to consideration of the factors described above, O’Black (2011) recommends that schools and

districts:

1. Conduct a needs assessment: To understand staff/school needs, administer a Needs Assessment survey to teachers/staff that asks about their technological capabilities related to integrating instructional technology, and then using results to customize professional development by building, grade level, and content area.
2. Develop an instructional technology plan: Develop with colleagues a systematic plan with a vision for incorporating technology into classrooms, conducting high-quality professional development, and modeling effective implementation; ensure teacher ownership to sustain the plan by cultivating and initiating building discussions of technology integration.
3. Provide high-quality professional development with supports and opportunities for collaboration: Technology professional learning should be personalized for teachers and should be ongoing, job-embedded and relevant to their instructional needs (Schifter, 2016; U.S. Department of Education, 2016). Leaders should “learn alongside teachers and staff members, ensuring that professional learning activities are supported by technology resources and tools, time for collaboration, and appropriate incentives” (U.S. Department of Education, 2016, p. 42). Teacher technology-enhanced professional development should be sustained (longer than one year), embedded in content, matched with stated objectives, and allow for teachers to reflect on and refine their pedagogical approaches (Gerard, Varma, Corliss, & Linn, 2011). Additionally, working with multiple teachers from the same school helps provide a supportive structure for technology integration (Gerard, Bowyer, & Linn, 2010).
4. Educate the school community about safe and responsible technology use: Develop approaches to instruct students, staff, and parents on ethical practices and safe guards for technology use. Ensure technologies are used in ways that are conducive to an effective learning environment.

References and resources

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