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Not surprising, 43 percent of students feel unprepared to use technology as they look ahead to higher education or their work life.
executive summary

With the intent to expand education beyond traditional boundaries, student-centered learning focuses on educational practices and principles that:

- Provide all students equitable access to the knowledge and skills necessary for college and career readiness in the 21st century,
- Focus on mastery of skills and knowledge, and
- Align with current research on how people learn.

As the principles guiding student-centered learning become more defined, increased attention is being paid to the tools and resources best suited to its successful adoption. On the surface, technology would seem to offer a natural—and accessible—way to advance student-centered learning. After all, in today’s public schools, there’s an average student to computer ratio of 4:1 and a teacher and student population ready, willing and able to use technology. Yet despite its availability, technology is not widely integrated into the learning experience. A recent survey of more than 1,000 high school teachers, IT staff and students shows that only 8 percent of teachers fully integrate technology into the classroom. Not surprising, 43 percent of students feel unprepared to use technology as they look ahead to higher education or their work life.

To learn more about how technology could enhance student-centered learning, Education Development Center (EDC) examined current research literature as well as practice and policy-related reports. This research was enriched by collaboration with EDC colleagues who have expertise on this subject as well as interviews with educators at selected schools. This report concludes that while technology can provide a powerful teaching and learning tool, it cannot drive reform on its own. To be widely adopted, technology must be part of a comprehensive and systematic effort to change education. This report provides a candid look at the potential technology offers and the steps needed to better understand when technology is most effective in student-centered learning—and for whom.

THE POTENTIAL TECHNOLOGY OFFERS

Because technology is both highly customizable and intrinsically motivating to students, it is particularly well-suited to expand the learning experience. To date, research on the effectiveness of technology has focused primarily on higher education and professional development, yet it suggests that specific uses of technology can improve K-12 student outcomes as well. Although the findings are general, and not necessarily specific to student-centered learning, they indicate that technology can:

Help diagnose and address individual needs. Technology can equip teachers to assess an individual student’s strengths and needs. Two main approaches to technology-supported assessment exist. One is a mastery learning approach tied to accountability systems. This enables teachers to benchmark students as they progress through a standards-based curriculum. The other assesses understanding which produces a picture of student thinking. Both approaches help establish a clear baseline from which teachers can then serve as coaches and
advisors, steering students to the right mix of resources and projects that meet curricular requirements.

**Equip students with skills essential for work and life in a 21st century global society.** Using technology for purposes, such as writing, research and analysis—rather than simply drills and practice—can enhance student competencies that surpass the knowledge and skills typically measured in achievement tests. These competencies include problem solving, creativity, collaboration, data management and communication. Many employers find these skills lacking among today’s college graduates. In addition, a number of organizations ranging from the Partnership for 21st Century Skills to the U.S. Department of Education see literacy in digital media as essential for succeeding in a global society.

Technology can equip students to independently organize their learning process. So, instead of being passive recipients of information, students using technology become active users.

**Provide an active experience for students.** Technology can equip students to independently organize their learning process. So, instead of being passive recipients of information, students using technology become active users. At the same time, technology transfers some responsibility for learning to students. Through online learning (which provides increased access to course content, more scheduling flexibility, and better access to alternative education choices) and alternative media (such as digital games and project-based learning), students have the flexibility to direct their individual progress.

**Some models are already in place** Clearly, student-centered learning places new demands on both students and teachers. Appendix 2 describes two examples of school models where technology has been successfully integrated into student-centered learning. These examples are based on two distinct approaches:

**High Tech High (HTH)** is a network of K-12 charter schools where the program and curriculum are based around personalization with strong student and faculty collaboration; adult world connection emphasizing community service projects and semester-long academic internships; and common intellectual mission based on a “technical” foundation, real-world career skills, and a “college prep” education.

Technology enables many of HTH’s innovative practices. For example, to aid classroom learning, schools are equipped with Specialty Labs dedicated to a range of sciences from biotechnology to robotics. Also, throughout their academic careers at HTH, students document their learning by compiling and presenting their work in digital portfolios. Moreover, HTH uses technology to emphasize assessment as an “episode of learning”—not as an endpoint—and offers its own teacher-credentialing program. To date, HTH reports sending 100 percent of its students to college.

**Quest To Learn,** a new public school in New York, has designed an integrated game-based curriculum that meets state and national standards while focusing on game-design and systems thinking. To achieve this, subject areas such as math, science, language
arts, and social studies are blended together into domains. Not only is technology prevalent throughout the curriculum, it also supports other Quest To Learn programs including a specially designed social networking application as well as a program evaluation and assessment lab.

**THE CHALLENGES TO OVERCOME**

Integrating technology into educational practices has proven to be a slow and complex process. In fact, it can take four or more years from the time new technologies are first introduced to the point when changes can be observed in students. To date, the most prevalent barriers to successful integration include organizational support, teacher attitudes and expectations, and technology itself.

*School culture and structure don’t support specific uses of technology.* Often, technology is not aligned with a school district’s vision, mission and curriculum. As a result, there is no foundation in place to provide consistent access to—and use of—technology throughout the K-12 years. Using technology to support student-centered learning requires leadership, administration and the community to collaborate and set an agenda for technology that reflects local needs, focuses on a common set of learning standards, and connects students to real-world audiences.

*Most teachers lack confidence in technology as well as their technology skills.* According to a National Center for Education Statistics study, only 23 percent of teachers surveyed feel prepared to integrate technology into their instruction. Those who use technology do so primarily to present information rather than to provide hands-on learning for students. Some are unclear about policies governing the use of technology. Others are uncomfortable with investing instructional time to deal with possible equipment failures or slow Internet access. Clearly, more of an investment in technology training and technical support needs to be factored into K-12 funding and resource allocation.

**CONCLUSION: TECHNOLOGY IS CRITICAL YET MORE TARGETED ANALYSIS IS NEEDED**

This report concludes that technology can support key practices of student-centered learning. This includes emerging technology already prevalent in the consumer and business worlds (such as digital books, cloud computing, collaborative environments, and mobile devices). Here’s how:

- Technology (done right) provides an invaluable way to deliver more personalized learning in a cost-effective way.

- Technology provides high-quality, ongoing feedback to teachers and students that can help guide the learning process. And when technology mirrors how professionals use it in the workplace, it can enhance academic achievement, civic engagement, acquisition of leadership skills, and personal/social development.

- Technology can be designed to provide adaptive learning and assessment experiences for students. Most important to student-centered learning, technology can enable outcomes that vary based on student strengths, interests, and previous performance.

While studies to-date have examined the effectiveness of specific technology uses on student learning, very few have addressed whether those uses can effectively produce different outcomes for different student subgroups. It’s still not clear, for example, which types of learners are most successful using online learning. Or more specifically whether the drop-out rates associated with online learning suggest that the amount of reading works against students with weak literacy skills. This report concludes that deeper analysis of outcomes for different student subgroups is needed before specific technology-enhanced instructional practices can be successful at reducing existing performance gaps.