Using Technology to Close the Achievement Gap

How Are Schools Using Technology Right Now?

“Teachers use computers to supplement and reinforce the existing teaching model. As such, computers add cost, while failing to revolutionize the classroom experience” — US Dept. of Education Report on Technology

- 5th graders report using computers just 24 minutes a week in school
- 8th graders report using computers just 38 minutes a week in school

Schools use computers as a topic to be taught, and not as a tool that could help students learn in ways that are customized to meet their needs.

How Can the Role of Technology be Transformed to Meet ALL Students’ Needs?

Computer-based learning offers a way to introduce a “student-centric” model that tailors education to the needs of each child.

“Student-centric learning opens the door for students to learn in ways that match their intelligence types in the places and at the paces they prefer by combining content in customized sequences...teachers can serve as professional learning coaches and content architects to help individual students progress – they can be a guide on the side, not a sage on the stage.”

- Clayton M. Christensen, Disrupting Class

Previously: Computerized Programs
- Textbooks, transferred to screen
- Does not adapt to student inputs
- Non-customizable

Today: Student-Centric Technology
- Animated, interactive materials
- Adaptable, varies every student’s path of learning
- Customizable for every child

“Urban secondary schools, especially in low-income areas are [an] ideal market for computer-based learning. Some of these schools are as resource-constrained as rural schools are, and may struggle to find highly qualified teachers who are committed to working in such challenging environments.” - Clayton M. Christensen, Disrupting Class

Potential for Impact using Student-Centric Technology

A Teacher’s Role:
- Instead of standing in front of the class, and spending the bulk of a class period delivering a lesson that may only resonate with a small segment of the classroom, teachers can spend class time working one-on-one with each student.
- Instead of spending vast amounts of time creating one-size-fits-all lessons each year, teachers can spend their preparatory time reviewing the performance of each student and creating customized plans for intervention.
- Because the process of grading assignments, homework, and assessments is automated, teachers invest their time in meticulous analysis of students’ performance, using detailed reports generated by the system to pinpoint weakness.

A Student’s Experience:
- Students become active participants in their own learning, instead of merely present in the class. Student-centered technology requires active input from each child to proceed with the lesson.
- Students receive instant feedback on each answer and are able to see step-by-step solutions instantly to missed problems.
- A flexible path of study is determined by each student’s level of ability. Learning is customized to provide gifted students with more challenging problems and extension activities, while multiple representations of a concept are provided to struggling students.
- Gaps in knowledge are diagnosed and remedied by the system, which analyzes student inputs and adjusts the content a child sees to address gaps in prior knowledge or remedy areas of weakness.
Closing the Achievement Gap with Technology

Reasoning Mind, a program that offers high-quality online mathematics curricula in tandem with intensive teacher professional development has shown tremendous potential for closing the US mathematics achievement gap. Using RM, the achievement gap has been closed for minority students with special needs, limited English proficiency, and students identified as at-risk. In many cases these students even outperformed non-RM students without any at-risk factors. Rigorous independent evaluations have consistently confirmed that students on the RM system show higher levels of achievement than their non-RM peers.

Proven Benefits of Using Computer-Based Technology for Students

- **Increased time on task.**
  Studies have shown that time on task in a classroom where students are engaged in computer-based learning is much higher than in a traditional classroom (Worthen, Van Dusen, & Sailor, 1994).

- **Improved student attitudes towards learning.**
  In studies conducted using an online mathematics curriculum, over 70% of the students indicated that they either liked math a whole lot more or more than they did previously after the program. (Waxman & Houston, 2008).

- **Data-driven instruction that closes gaps in knowledge**
  Teachers can use data from computer-based curriculum to identify areas of weakness and work one-on-one with the students who need it most. Data-driven instruction means that teachers focus intervention in the areas it will do the most good (National Mathematics Advisory Panel, 2008).

- **Increased face-to-face interaction with the teacher.**
  Previously, 80% of a typical teacher’s time was be spent preparing to teach, teaching, and testing. Less than 20% was available to help students individually. Freed from these routine tasks, teachers can create individualized intervention plans, increasing the timeliness and frequency of direct instruction for the students who need it most (Christensen, 2008).

- **High-quality curriculum and instruction in every classroom.**
  Administrators using a web-based curriculum can be assured that a program of study will be delivered in a consistent manner across all classrooms, with appropriate content and pedagogies (Christensen, 2008).

- **A classroom that meets every child’s needs.**
  Technology that adjusts the path of learning for each student and provides multiple learning modes for students to practice skills has been shown to dramatically boost achievement. (Schacter, 2001; Sivin-Kachala, 1998; Wenglinsky, 1998).

**Recommended Reading:**


For more information on how urban schools are using technology to close the achievement gap visit [www.reasoningmind.org](http://www.reasoningmind.org)