The Digital Divide in the Age of the Connected Classroom
How Technology Helps Bridge the Achievement Gap

Fourth in a series exploring the impact of and challenges surrounding technology in schools

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Introduction: The Digital Divide

As educators and policymakers increasingly turn to technology to advance objectives in the classroom, it is no surprise to witness a corresponding rise in their belief that technology holds the key to leveling the playing field for students across the socio-economic spectrum. However, just like students, the potential of technology can only be maximized within an ideal environment; unequal Internet and device access at home, varying funding across school districts and states, and parents who do not understand how to navigate and use digital tools severely limit student access to the benefits technology offers. Some even argue that the rampant adoption of technology by schools may be exacerbating the already substantial achievement gap, creating a new phenomenon in the realm of education: the digital divide. As 2016 begins, steps must be taken to ensure that students and schools are equipped to deal with the myriad inequalities that affect educational outcomes, including those in Education Technology.

EdTech and the Achievment Gap: 5 Steps to Help Bridge the Divide

1. School districts must understand their socio-economic context and implement technology programs that students can access easily and equally.
2. For a robust BYOD program, EdTech software must be compatible with a wide range of devices.
3. To level the playing field in a BYOD classroom, schools must supply supplemental technology to underprivileged students.
4. Libraries and schools should offer tech training for parents.
5. Community leaders, parents, schools and EdTech providers must team up to ensure widespread access to devices and broadband connections in schools and beyond.

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The ***digital divide*** refers to the growing gap between the underprivileged members of society, especially the poor and rural portion of the population who do not have access to computers or the internet, and the wealthy and the middle-class living in urban and suburban areas who have access.[1] The ***achievement gap*** refers to any significant and persistent disparity in academic performance or educational

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attainment between different groups of students, such as white students and minorities, or students from higher-income and lower-income households.[2]

Technology in the classroom promises to be a great equalizer, but effective implementation must consider the socio-economic context of the school district and include programs and practices that facilitate universal student access. To ensure students become responsible digital citizens endowed with the cognitive and competitive skills they will need in the future, bridging the digital divide must be a central strategy in closing the achievement gap.

Technology and Disparity in the Classroom

Addressing disparity in the classroom can have positive, long-term repercussions across society. According to a study by the Center for American Progress, if the United States were able to close the educational achievement gaps between native-born white children and black and Hispanic children, the U.S. economy would be 5.8 percent—or nearly $2.3 trillion—larger in 2050.[3] Access to technology in the classroom can greatly improve the quality of a student's education, and it has the potential to bridge the achievement gap. At-risk students especially benefit from technology that is designed to promote high levels of interactivity and engagement with data and information in multiple forms.[4] A recent Stanford study found that students who worked with teachers alongside their online experience were much more likely to say they developed an interest in the subject and improved their academic standing.[5]

However, schools districts do not enjoy equal access. For example, the Philadelphia school system has one computer for every two students, but 60 percent of those computers are more than five years old – many are as old as nine, with only two schools in the district having enough computers for each student.[6] More than two thirds of districts nationwide are cutting back on regular maintenance and replacement of technology because of budget troubles.[7] According to a 2013 Pew Research study, only 54 percent of middle and high school teachers surveyed thought their students "have sufficient access to digital tools at school," and 84 percent said that "today's digital technologies are leading to greater disparities between affluent and disadvantaged schools and school districts."[8] Students who learn with laptops, tablets and other digital devices will adopt specific social and emotional skills, particular thought patterns, and ways of interacting with the world that will eventually become the new normal.[9] Wealthier school districts have more to offer their in-turn wealthier students, which only exacerbates the achievement gap and digital divide.

> **At-risk students benefit from technology that is designed to promote high levels of interactivity and engagement with data and information in multiple forms.**
>
> Source: *Using Technology to Support At-Risk Students' Learning*
> Stanford University

The achievement gap between children from high- and low-income families is roughly 30 to 40 percent larger among children born in 2001 than among those born 25 years earlier.[10] The income achievement gap is now almost twice as large as the black-white achievement gap, while fifty years ago the black-white gap was one and a half to two times as large as the income gap.[11] Closing the digital divide alone will not transform learning; we must ensure all students understand how to use technology as a tool to engage in creative, productive, life-long learning rather than simply consuming passive content.[12]

Another issue is technology implementation. Schools can choose between Bring-Your-Own-Device (BYOD) policies or supplying students with laptops and devices. The BYOD strategy can save school districts money, but it can create an environment in which access to digital learning resources is distributed disproportionately to students whose families can afford the devices, thereby widening the very gaps that technology is capable of closing. It can also be very challenging for teachers to manage learning experiences and activities when they have to support multiple platforms and device types, and some activities and applications may only be incompatible with certain devices.[13] Solutions that address these issues in a BYOD system include supplementing devices for students unable to afford them and investing in classroom management systems that create a unified, single-access oversight environment for the teacher.

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>
> Source: *Future Ready Learning: Reimagining the Role of Technology in Education*
> U.S. Dept. of Education

Unequal Access at Home

Gaps in academic achievement result from a host of issues, such as income inequality, access to child care and preschool programs, nutrition, physical and emotional health, environmental factors, community and family structures, differences in the quality of instruction and school, and parental educational attainment.[14] Differences in home life create the gap and allow it to persist later on in life, with higher-income, college-educated parents investing more time in their child's school life by volunteering at school and offering educationally enriching activities at home.[15]

EdTech has added a new layer of complexity. Many schools are equipped with Internet access, mobile and smart devices, and electronic tools to assist teaching and learning. But what happens when students go home? High-quality digital learning experiences can be hard to carry over when 30 percent of households do not have high-speed broadband, a problem disproportionately common in rural and underserved communities.[16] The achievement gap begins in the home and widens as students lack access to technology and families lack the digital literacy skills to use technology effectively.

This is not news. According to a 2012 LEAD Commission study, 95 percent of teachers and 90 percent of parents believe that home access to high-speed Internet gives students an advantage when it comes to classroom performance.[17] Once a school decides to adapt the curriculum to a more technology-based model, the gap is widened in terms of what students can do.[18] A recent poll found that 82 percent of teachers and 71 percent of parents believe greater use of technology would be helpful in connecting learning inside and outside of the classroom.[19] This leads logically to widespread understanding that the digital divide exacerbates the already widening achievement gap between rich and poor students.

Digital literacy will become subject to the digital divide if access is not granted equally, and digital literacy is a crucial skill required for almost any job a student can hope to attain in the future.[20] Early, quality access to technology with guidance from people who can use it gives students a head start at home and in school. Because wealthier children have more access to digital tools, they are learning to

think, behave and make meaning in ways that likely correlate with elite status and success in the future. Underprivileged children do not have access, so they do not learn the same things, putting them at a distinct disadvantage.[21] There are deep consequences of the disparity that results from unequal exposure to educational technologies.[22]

Recommendations to Level the Playing Field

Technology stands to become a radical equalizer in the realm of education, but it must be implemented in a way that allows every student, teacher and parent to access everything that is needed during a student's learning journey. To do so, big steps must be taken. Teachers must be given time to train on

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and understand the platforms they are using, and learn how to integrate them into a class of students who may not have access to the Internet or mobile devices at home. Many parents do not understand how to use the Internet as effectively as their children, so offering technology training to parents early on in a child's education will accrue wide benefits.

Schools need a system that can address issues inherent in BYOD models. A management system that unifies classroom technology can help bridge the gap and facilitate teaching, saving time, minimizing disruptions and making the teacher's job easier. In addition, with BYOD set-ups, the value of having a system that works on every platform cannot be underestimated. Some students may have laptops, others tablets and some may have smartphones. A broad software system that seamlessly links all devices for teachers saves valuable instruction time and minimizes distractions.

Implementing a program that benefits the greatest number of students is key. If some students do not have access to the Internet or devices at home, learning stops when they leave the classroom, while their wealthier peers maintain a rich educational environment at home. While policies and programs have been introduced to help students stay connected outside the classroom, even nationally with the Administration's ConnectED program, understanding and evaluating a technology program based on student access is important.

Steps that help ensure students are groomed to be well-informed, savvy digital citizens include:

1. School districts must understand their socio-economic context and implement technology programs that students can access easily and equally.
2. For a robust BYOD program, EdTech software must be compatible with a wide range of devices.
3. To level the playing field in a BYOD classroom, schools must supply supplemental technology for underprivileged students.
4. Libraries and schools should offer technology training for parents.
5. Community leaders, parents, schools and EdTech providers must team up to ensure widespread access to devices and broadband connections in schools and beyond.

Finding ways to make technology accessible across the board must be a goal for school districts nationwide. It is no longer a luxury; it is a 21st century necessity.

[1] Stanford University. *Digital Divide.* n.d. http://cs.stanford.edu/people/eroberts/cs201/projects/digital-divide/start.html (accessed 12 9, 2015).

[2] EdGlossary. *Acheivement Gap.* December 19, 2013. http://edglossary.org/achievement-gap/ (accessed January 7, 2016).

[3] Oakford, Robert Lynch and Patrick. "The Economic Benefits of Closing Educational Achievement Gaps." *Center for American Progress.* November 10, 2014. https://www.americanprogress.org/issues/race/report/2014/11/10/100577/the-economic-benefits-of-closing-educational-achievement-gaps/ (accessed December 14, 2015).

[4] *Ibid.*

[5] Linda Darling-Hammond, Molly B. Zielezinski, and Shelley Goldman. "Using Technology to Support At-Risk Students' Learning." *Stanford Center for Oppourtunity Policy in Education.* September 2014. https://edpolicy.stanford.edu/sites/default/files/scope-pub-using-technology-report.pdf (accessed May 22, 2015).

[6] Garland, Sarah. "Can high-poverty urban districts like Philadelphia close the digital divide?" *The Hechinger Report.* June 17, 2014. http://hechingerreport.org/can-high-poverty-urban-districts-like-philadelphia-close-digital-divide-2/#schools (accessed December 15, 2015).

[7] *Ibid.*

[8] Kristen Purcell, Alan Heaps, Judy Buchanan and Linda Friedrich. "How Teachers Are Using Technology at Home and in Their Classrooms." *Pew Research Center.* February 28, 2013. http://www.pewinternet.org/2013/02/28/how-teachers-are-using-technology-at-home-and-in-their-classrooms/ (accessed December 11, 2014).

[9] Shapiro, Jordan. "Technology skills only scratch the surface of the digital divide." *The Hechinger Report.* November 19, 2014. http://hechingerreport.org/technology-skills-scratch-surface-digital-divide/ (accessed December 4, 2015).

[10] Reardon, Sean F. "The Widening Academic Achievement Gap Between the Rich and the Poor: New Evidence and Possible Explanations." In *Whither Opportunity?: Rising Inequality, Schools, and Children's Life Chances*, by Greg J. Duncan and Richard J. Murname, 91-116. New York: Russell Sage and Spencer Foundations, 2011.

[11] *Ibid.*

[12] U.S. Department of Education, Office of Educational Technology. *Future Ready Learning: Reimagining the Role of Technology in Education.* January 2016. http://tech.ed.gov/files/2015/12/NETP16.pdf (accessed January 5, 2016).

[13] *Ibid.*

[14] Oakford, Robert Lynch and Patrick. "The Economic Benefits of Closing Educational Achievement Gaps." *Center for American Progress.* November 10, 2014. https://www.americanprogress.org/issues/race/report/2014/11/10/100577/the-economic-benefits-of-closing-educational-achievement-gaps/ (accessed December 14, 2015).

[15] *Ibid.*

[16] U.S. Department of Education, Office of Educational Technology. *Future Ready Learning: Reimagining the Role of Technology in Education.* January 2016. http://tech.ed.gov/files/2015/12/NETP16.pdf (accessed January 5, 2016).

[17] LEAD Commission. Parents' And Teachers' Attitudes and Opinions On Technology in Education. August 2012. http://www.leadcommission.org/sites/default/files/LEAD%20Poll%20Deck.pdf (accessed May 27, 2015).

[18] Monahan, Rachel. "What Happens When Kids Don't Have Internet at Home?" *The Atlantic.* December 12, 2014. http://www.theatlantic.com/education/archive/2014/12/what-happens-when-kids-dont-have-internet-at-home/383680/ (accessed December 15, 2015).

[19] LEAD Commission. Parents' And Teachers' Attitudes and Opinions On Technology in Education. August 2012. http://www.leadcommission.org/sites/default/files/LEAD%20Poll%20Deck.pdf (accessed May 27, 2015).

[20] Shapiro, Jordan. "Technology skills only scratch the surface of the digital divide." *The Hechinger Report.* November 19, 2014. http://hechingerreport.org/technology-skills-scratch-surface-digital-divide/ (accessed December 4, 2015).

[21] *Ibid.*

[22] *Ibid.*