



# Equity and Personalized Learning: A Research Review

## THE COUNCIL OF CHIEF STATE SCHOOL OFFICERS

The Council of Chief State School Officers (CCSSO) is a nonpartisan, nationwide nonprofit organization of public officials who head departments of elementary and secondary education in the states, the District of Columbia, the Department of Defense Education Activity, and five U.S. extra-state jurisdictions. CCSSO provides leadership, advocacy, and technical assistance on major educational issues. The Council seeks member consensus on major educational issues and expresses their views to civic and professional organizations, federal agencies, Congress, and the public.

### COUNCIL OF CHIEF STATE SCHOOL OFFICERS

Carey Wright (Mississippi), President

Chris Minnich, Executive Director

### Equity and Personalized Learning

Rashawn Ray, Ph.D.

Associate Professor of Sociology

University of Maryland

[rjray@umd.edu](mailto:rjray@umd.edu)

Lynne Sacks, Ed.D.

Education Redesign Lab

Harvard Graduate School of Education

[lynne\\_sacks@gse.harvard.edu](mailto:lynne_sacks@gse.harvard.edu)

Janet S. Twyman, Ph.D.

Associate Professor of Pediatrics

UMass Medical School

Director of Innovation and Technology

Center on Innovations in Learning

[jstwyman@gmail.com](mailto:jstwyman@gmail.com)

\*Commissioned by the America Forward/New Profit's Reimagine Learning Fund  
and the Council of Chief State School Officers (CCSSO).

Council of Chief State School Officers

One Massachusetts Avenue, NW, Suite 700 • Washington, DC 20001-1431

Phone (202) 336-7000 • Fax (202) 408-8072 • [www.ccsso.org](http://www.ccsso.org)

Cover Photo credit: Courtesy of Allison Shelley/The Verbatim Agency for American Education: Images of Teachers and Students in Action.



© 2017 by CCSSO. *Equity and Personalized Learning: A Research Review* is licensed under a Creative Commons Attribution 4.0 International License <https://creativecommons.org/licenses/by/4.0/>.

## CONTENTS

Background: .....	3
Literature Review: Equity for Personalized Learning.....	3
What Is Personalized Learning?.....	4
Barriers to Personalized Learning for Historically .....	5
Underserved Students .....	5
Policymaker Awareness: Lack of Policymakers’ Knowledge about Students’ Needs.....	5
Access to Rigorous Instruction and High-Quality Resources .....	6
Technology Access: Inadequate Assistance with New Technology .....	7
Educational Practices to Improve Achievement .....	8
Personalized Learning Plans .....	8
Universal Design for Learning and Multi-Tiered Systems of Support.....	9
Embracing Diversity .....	10
Role of Technology in Personalized Learning .....	10
Conclusion and Considerations for Further Work .....	11
Policies to Improve Personalized Learning for Historically Underserved Students .....	12
References.....	14

## **America Forward:**

[The America Forward Coalition](#) is a network of more than 70 innovative, impact-oriented organizations that foster innovation, identify more efficient and effective solutions, reward results, and catalyze cross-sector partnerships in education, early childhood, workforce development, youth development, and poverty alleviation. Our Coalition members are achieving measurable outcomes in more than 14,500 communities across the country every day, touching the lives of nearly 8 million Americans each year. We believe that innovative policy approaches can transform these local results into national change and propel all of America forward.

## **New Profit's Reimagine Learning Fund:**

Reimagine Learning exists to put the diverse needs of our most vulnerable K-12 students at the center of the national dialogue about the future of learning in the U.S. We support communities and schools to create teaching and learning environments that unleash creativity and potential in all students – including and especially those who have been systematically underserved – enabling them to realize academic and life success. Reimagine Learning is a five-year, \$35M fund launched in 2013 by New Profit and a set of funder and practitioner partners focused on spreading practices that support the success of the most vulnerable students. Reimagine Learning has grown into a cross-sector network of over 500 education leaders focused on transforming the understanding of learners that drives the design of schools and school systems.

## **The Council of Chief State School Officers**

The Council of Chief State School Officers (CCSSO) is a nonpartisan, nationwide nonprofit organization of public officials who head departments of elementary and secondary education in the states, the District of Columbia, the Department of Defense Education Activity, and five U.S. extra-state jurisdictions. CCSSO provides leadership, advocacy, and technical assistance on major educational issues. The Council seeks member consensus on major educational issues and expresses their views to civic and professional organizations, federal agencies, Congress, and the public.

## **The Innovation Lab Network**

The ILN is a group of states taking action to identify, test, and implement student-centered approaches to learning that will transform public education system by scaling locally-led innovation to widespread implementation within and across states. Schools and districts within these states have been given the opportunity to act as pressure-testers of new and innovative ways to address the needs of their students, with backing and support from their state departments of education. Current states in the ILN include Arkansas, California, Colorado, Iowa, Kentucky, New Hampshire, Ohio, Virginia, Vermont, West Virginia and Wisconsin.

## BACKGROUND:

Driven by a shared commitment to identifying both promising practices and systemic barriers that impact personalized learning efforts across the nation, CCSSO, New Profit and America Forward co-convened a personalized learning equity work group in 2016 inclusive of seven states and a number of content experts. The task was clear: state chiefs (commissioners, superintendents, and/or secretaries of education) and other SEA leaders wanted accessible research to inform their work in state policy and practice for personalized learning, with the ultimate goal of producing a research document that could identify bright spots in practice and policy to support equitable access for personalized learning. Our research team set out to synthesize the existing peer-reviewed research on personalized learning as it relates to the following five groups of historically underserved students: students of color, students living in poverty, students who have experienced trauma, English learners (ELs), and students with disabilities (SWDs). This literature review has a complimentary resource comprised of interviews with leading voices from the field, which, when taken together, illustrate a powerful story about how we can leverage promising work in the personalized learning field to support our historically underserved and disenfranchised students.

Our hope is that this document accelerates conversations about both the promise of personalized learning, and the conditions and considerations necessary to ensure that personalized learning efforts disrupt deep inequities in education rather than promulgating existing trends. Driven by the promise of this vision and the hard work of educators, policy makers, and partners working towards this aim, we are committed to continuing and deepening the conversation.

## LITERATURE REVIEW: EQUITY FOR PERSONALIZED LEARNING

Personalized learning environments are designed to give students greater ownership of their learning and aim to tailor instruction according to individual learner readiness, strengths, needs, and interests. Components of personalized learning environments may encompass learner-driven content and pace of instruction, project-based learning, individualized learning plans, competency-based progression, blended learning, performance-based assessments, and student portfolios of work.

As personalized learning continues to gain traction across the country, there is a growing concern that it may not be meeting the needs of students from historically underserved groups, including students of color, students living in poverty, English Learners, Students with Disabilities (SWDs) and students who have experienced trauma. Although personalized learning has the unique opportunity to reduce or eliminate educational inequity, there is also an opportunity for it to inadvertently *increase* educational inequity by making it easier for schools to justify the stymied progression of certain students through academic material or by failing to design curricula tailored to the specific needs of historically underserved students. Equitable education policy must provide students with the flexibility to pursue and align their personal strengths and interests

with academic achievement, as well as provide a set of supports to address barriers students face to effective learning. (Gleason & Gerzon, 2013). This research overview examines the existing literature on how to deliver personalized learning with equity focused on the following five groups of historically underserved students: 1) students of color, 2) students living in poverty, 3) students who have experienced trauma, 4) English language learners (ELLs), and 5) students with disabilities (SWDs). In doing so, we aim to illuminate common barriers to successfully implementing personalized learning among these populations, educational practices that improve student achievement, and policies that may improve personalized learning for these students.

## WHAT IS PERSONALIZED LEARNING?

The Institute for Personalized Learning defines personalized learning as a variety of academic approaches to learning and instruction where teachers and students work together to tailor education around individual learner readiness, strengths, needs, and interests. In a personalized learning environment,

*“Learners are active participants in setting goals, planning learning paths, tracking progress and determining how learning will be demonstrated. At any given time, learning objectives, content, methods and pacing are likely to vary from learner to learner as they pursue proficiency relative to established standards.”*

–Institute for Personalized Learning

Personalized learning aims to shift education from a passive, teacher-driven endeavor based on uniform curricula to an active process that puts students at the center and incorporates new approaches to teaching to meet the unique needs of individual learners.

Personalized learning is designed to give all students greater ownership over their learning. Jenkins and Keefe (2002) note that personalized learning expands the teacher role to that of a learning coach, creates an interactive and collegial environment for students, includes flexible scheduling throughout a school day, and provides meaningful assessment of tasks at hand. Tactics around personalized learning may consist of but are not limited to the following activities: project-based learning assignments, creating customized learner profiles for students, establishing individualized learning plans with a focus on competency-based progression, exercising blended learning in the classroom, establishing performance-based assessments, and creating student portfolios (2014).

As an entry point to considering the critical need to approach personalized learning efforts with an equity lens, and where current policies leave off, we look to IDEA. The *Individuals with Disabilities Education Act* (2004) recommends explicitly designing instruction around the individual needs of students. Personalized learning’s emphasis on individual learning paths resembles the goals of the Individualized Education Plan (IEP); additionally, many components of personalized learning closely mirror those well established as effective practices for SWDs, ELs, and students of color. This includes adapting and differentiating instruction based on individual student needs, building



upon individual strengths, altering curriculum and assessment to support learning, and using data to inform and improve instruction. Furthermore, the Every Student Succeeds Act codifies the value of districts leveraging competency based assessment and authorizes up to 7 state to pursue pilots of this work. However, persistent achievement gaps remind us that existing policy may be a step towards a vision of personalized learning but it is currently insufficient. Historically, students who face additional barriers to learning, included those who are highlighted as focus populations in this document, by and large do not have access to comprehensive personalized learning approaches that move beyond accommodations and discreet programs to design education reform efforts centered on student agency, competency-based progressions and flexibility.

## **BARRIERS TO PERSONALIZED LEARNING FOR HISTORICALLY UNDERSERVED STUDENTS**

Our review of the literature on personalized learning for historically underserved students revealed three common barriers: 1) policymaker awareness, or a lack of policymaker knowledge and understanding about students' needs; 2) instructional rigor, or a mismatch between expectations of high standards and the relegation of historically underserved students to classrooms with less rigor; and 3) technology access, or inadequate assistance with new technologies.

### ***Policymaker Awareness: Lack of Policymakers' Knowledge about Students' Needs***

Research suggests policymakers at all levels of education as well as key decision-makers lack information and knowledge about the challenges that historically underserved students face in personalized learning settings (Jones & Casey, 2015). Policymakers should consider these students' unique needs and use data/research-based decisions relating to federal, state, and local policy; funding mechanisms; professional development for teachers; appropriate and effective curricula; resources and infrastructure; data and informational system alignment with student-centered learning; data privacy and security protection; and raising stakeholder awareness and support (Jones & Casey, 2015, National Center for Learning Disabilities, 2015).

Policymakers can increase their knowledge of the needs of historically underserved students in personalized learning environments through commissioned research and the creation of principles or guidelines to assist policymaking and implementation. Unfortunately, there is little empirical research on how to measure and evaluate the success of historically underserved students in personalized learning environments. We attempted to address this by creating, in addition to this report, a supplementary collection of qualitative interviews of teachers, administrators, and students who have experienced or implemented personalized learning. Still, existing principles or policy frameworks lack explicit recommendations for addressing the needs of these students. For example, Bellwether Education's *Policy Playbook for Personalized Learning: Ideas for State and Local Policymakers* (Chuong & Mead, 2014) raises the issue of designing personalized learning environments for equity but falls short of recommending specific actions for states, districts, schools, or local stakeholders.

Two noteworthy examples that offer specific recommendations as to how policymakers can and should develop an equity lens with which to view personalized learning include the comprehensive set of guidelines for including SWDs in personalized learning settings issued by the National Center on Learning Disabilities (NCLD) as well as a similar set of considerations put forth by the National Council of La Raza (NCLR) regarding the ways in which personalized learning can support ELs (2016). NCLD's recommendations include using personalized learning as a mechanism to destigmatize special education, continuously monitoring student pace and progress and intervening where appropriate, and creating comprehensive and dynamic learner profiles that work with IEPs to inform instruction and guide learning. In their work, NCLR identified both opportunities and potential challenges for ELs in personalized learning, particularly the "psychosocial and cultural elements" (National Alliance for Excellent Education et al., 2016) that impact the learning of ELs; the need to align English language development with academic content goals; and ELs' lack of access to the internet and technology (Brown & Doolittle, 2008; Halle et al., 2014). Psychosocial elements may include attentiveness to the psychological and emotional adjustments that students must make when transitioning from one country and school system to another. Cultural elements may include incorporating symbols from students' countries of origin to enhance language acquisition.

### ***Access to Rigorous Instruction and High-Quality Resources***

In traditional classrooms, there is evidence that historically underserved students, ELs in particular, are more likely to be assigned to unchallenging subject-area classes which can cause academic development and cognition to stagnate (Robinson-Cimpian, Thompson, & Umansky, 2016). Access to high quality personalized learning can overcome this challenge through self-paced instruction. Whereas traditional public education often plows through academic material on a time-sensitive course towards end-of-year assessments, inevitably leaving some students behind, personalized learning offers all students an opportunity to adjust the pace and progression of their learning towards high standards, so that they do not become overwhelmed nor intellectually disengaged. However, teachers also have to be mindful not to use self-pacing as an excuse to not challenge their students to reach their full potential, lest they miss the purpose of a truly personalized learning environment. It should go without saying that even within a school that has the resources to effectively implement personalized learning, students can still be tracked into less rigorous coursework and fewer pathways post-graduation. Administrators, educators, and advocates should work together to ensure that students are all working towards the same high standards and learning goals.

In addition to ensuring that all students are put in position to reap the benefits of personalized learning, policymakers should consider how colorblind education policies negatively affect the experiences of students of color in the classroom (Lewis, Chesler, & Forman, 2000; Achinstein et al., 2016). Colorblind education policies are labeled as such because they do not address how race impacts student learning and instead assume that students are treated equally inside and outside of school. To the contrary, several studies show that teachers are more likely to hold negative views about Black and Latino students as well as SWDs (Ferguson, 2001; Moore, 2005; Hornstra et al.,



2015). The perception that these students cannot handle challenging and self-directed work may lead teachers to invest in them less during classroom instruction (Darling-Hammond, 2010). Such biases can be particularly harmful in personalized classrooms where daily learning experiences are allowed to vary from student to student. Policymakers and stakeholders should address these issues by implementing implicit bias and anti-discrimination training to better ensure that historically underserved students are treated equitably in personalized learning settings.

It should also be noted that while there is a strong correlation between students of color and those in poverty, these subgroups are not synonymous (Carter, 2005; Kozol, 2006). Personalized learning can be designed to equip educators with the ability to address the needs of traditionally underserved students, as well as the ability to do so in a way that distinguishes and disentangles issues of race and class (Phillips, 2015). An educator employing personalized learning in their classroom has the potential to be culturally responsive to an African-American male student from an affluent background, as well as an African-American male student living in poverty. The difference is that the culturally responsive practices will need to be different to affirm and support these students, because the two may have very different lived experiences and cultural identities based on the income difference.

### ***Technology Access: Inadequate Assistance with New Technology***

Disparities in access to and the use of technology have been closely associated with socioeconomic status, ethnicity, primary language, educational level, and disability status (Pew Internet & American Life Project, 2007). Historically underserved students may be less likely to have access to new forms of technology (Ray, Gilbert, & Sewell, 2016; Webb, 2006) or receive the support necessary to fully utilize accommodations even if they are available (Lazar & Jaeger, 2011). Further, SWDs are more likely to need additional assistance when using different kinds of technology for learning and instruction, which can be found in the foundational work of Universal Design for Learning (UDL). One of the pieces of literature signaled that historically underserved students may be more likely to need assistance in the “student agency” and “voice and choice” aspects of personalized learning, whereby students are given autonomy in advocating for their own learning and assessment needs as opposed to allowing the teacher or instructional coach to make those decisions for them. (Wehmeyer, 2002; Wehmeyer, Martin, & Sands, 2008). One potential reason for this could be historic views, held by administrators, teachers, and parents, of the ability of these students to make informed decisions for themselves. Another reason might include educator understanding of learner variability and knowledge/skills to respond to differences with a variety of instructional approaches and tools. Teachers, students, and parents will require training and additional skills to match student ability and needs to learning goals and to determine how technology can help achieve those goals (Hasselbring & Glaser, 2000). It is important to note that technology is used to enhance and not replace existing face-to-face instruction. We speak more to this important point below.

## EDUCATIONAL PRACTICES TO IMPROVE ACHIEVEMENT

Existing research shows generally positive relationships between personalized learning and educational outcomes (indicators of engagement, academic achievement and more) for historically underserved students. This research is beginning to confirm the positive effects of a well-implemented personalized learning model for increasing engagement and improving student achievement. For example, a recent RAND study focused on five personalized learning practices: learner profiles, personalized learning pathways, competency-based progression, flexible learning environments, and an emphasis on college and career readiness. The study findings suggested that personalized learning has a significant, positive effect on both reading and math scores for students. The study also suggested, but did not find a causal link, that personalized learning could be a tool by which educators close academic achievement and educational equity gaps. (Pane, Steiner, Baird, & Hamilton, 2015). The authors cited additional personalized learning practices that have strong evidence of effectiveness, including making time for individual student academic support, using data to understand student progress and make instructional decisions, and the use of technology to support personalization.

Additionally, a study by the Stanford Center for Opportunity Policy in Education (SCOPE) examined outcomes for students at four student-centered high schools in California (Friedlaender et al., 2014). The schools used either the Linked Learning or Envision Schools model to personalized learning. The Linked Learning model introduces students to career-based learning and real-world workplace experiences. The Envision Schools model is a charter network that creates personalized learning environments for students. At three of the four schools, ELs had achievement gains and graduation rates that were higher than those for ELs in the surrounding schools. Students of color and low-income students at all of the schools saw achievement gains that were significantly greater than similar students at surrounding schools.

Despite the relative shortage of peer-reviewed studies on the effects of personalized learning on the achievement of historically underserved students, research has informed various efforts to define best practices for educating students with different characteristics. A number of these efforts reflect the principles of personalized learning across the groups addressed in this paper. Some of the connected themes across groups include: 1) creating personalized learning plans; 2) applying universal design principles for learning (UDL) and multi-tiered systems of support; 3) embracing diversity; and 4) integrating the use of technology.

### *Personalized Learning Plans*

The creation of personalized learning plans was a consistent theme throughout our review of the literature. Typically co-created by teachers and students, personalized learning plans (PLPs) vary by school but generally incorporate individual student strengths and skills, skills gaps, and academic aspirations to chart students' progress toward both individual goals and classroom or school-based learning targets. PLPs become the basis for providing customized instruction, curricular pathways, and interventions tailored to individual students' needs. PLPs may trigger specialized

tutoring programs, which historically have been used to address skill deficits for underserved students (Hwang, Chen, & Huang, 2016; Wang & Wang, 2016). When combined with other personalized learning practices, they may also improve outcomes among low-income students. For example, data on student outcomes from Summit Public Schools, a charter network that combines personalized learning plans with self-pacing and student-driven projects, show that ELs in Summit schools significantly outperform ELs in non-Summit schools in the same districts on California’s Academic Performance Indicator (API), despite arriving at Summit schools with scores that were lower than the district averages.

Like IEPs, PLPs can also indicate practices or accommodations specifically designed to improve learning outcomes for historically underserved students. While some research-backed EL teaching practices are already germane to the practice of personalized learning, such as individualizing instruction and providing opportunities for student-driven, project-based learning (August & Hakuta, 1998; Baecher, 2011; Fairbain & Jones, 2010; Peyton, Moore & Young, 2010), other core elements of teaching ELs are more specialized and can be made explicit in PLPs. Such practices include teaching English vocabulary and grammar and making modifications to the language of instruction to make academic content more comprehensible (August & Hakuta, 1998; August & Shanahan, 2006; Echevarria, Vogt, & Short, 2000; Haynes & Zacarian, 2010), and ensuring that instructional materials are scaffolding language elements without diminishing the rigor of the content. Effective personalized learning for ELs will need to incorporate the language-based elements in addition to those that are student-centered—PLPs can explicitly call for these elements.

### ***Universal Design for Learning and Multi-Tiered Systems of Support***

According to the National Center for Learning Disabilities (NCLD), two critical frameworks must converge in order for all learners—especially SWDs—to fully benefit from personalized learning: universal design for learning (UDL) and multi-tiered systems of support (MTSS) (Trainor et al., 2008). UDL is an approach focused on increasing student access to augmented materials and multiple modes of instruction (Rose, 2000; Rose & Meyer, 2000), and fostering the development of curricula to support access, participation, and progress in all facets of learning (Hall, Strangman, & Meyer, 2003). For students with sensory and intellectual disabilities, these practices reduce accessibility barriers inherent in most educational materials, providing alternatives (e.g., text to speech) and multiple modalities (e.g., close captioning) as well as simplified text. UDL principles intend to reflect the ways that students process information (Rose & Meyer, 2002) and thus may be used to develop goals, instructional methods, alternative assessments, and classroom materials. Applications of UDL may improve outcomes for diverse learners by providing improved access to content and enhancing the use of technology to complement personalized learning.

MTSS provides supports and interventions to students through the system-wide use of evidence-based practices of varying intensity and data-based decision making in response to individual academic and other needs (Utley & Obiakor, 2015). A system-wide MTSS uses a tiered approach to provide a continuum of structures, resources, strategies, and practices to cohesively and

coherently meet the needs of all learners (Averill & Rinaldi, 2011). One challenge, which many practitioners are unpacking, is how to increase and vary the intensification of personalized learning within school environments that also employ MTSS interventions. Numerous states and districts have implemented an MTSS framework that could be leveraged to inform personalized learning practices for all learners.

### ***Embracing Diversity***

Considering a learner's context and history, adapting teaching techniques, and incorporating social experiences outside of school are strategies that can be used to embrace cultural, racial/ethnic, and linguistic diversity. Historically underserved students, as with all students, deserve to have their personhood embraced and celebrated; without this, students may feel disconnected from their schools and communities in a way that impedes their learning (Berry & Candis, 2013; Gay, 2010).

Inclusive community partnerships, as exemplified by the Oakland (CA) Unified School District (OUSD), can support personalized learning by providing student and family support services for all students (See Hanover Research, 2012). According to Sebba (2007) schools can personalize learning for students of color through enhanced community ties. Strategies include recruiting and retaining a diverse educator workforce, providing cultural responsiveness trainings to teachers and staff, and ensuring the environment is welcoming to both EL students and their families.

Similarly, personalized learning environments allow educators to build greater awareness of and support for students living with trauma. Much of the research on personalized learning for students living with trauma stems from the field of social work. This literature centers mostly on ways to help students living with trauma cope in the classroom and function in ways that allow them to focus, learn, and avoid incidents that may trigger collective memories of their trauma. The literature includes ways schools can assist students with trauma, focusing on three main areas. First, it is important to introduce improved teacher training to help identify and serve students experiencing trauma and reduce victimization in the classroom (Cunningham, 2016). Second, schools can implement student trauma groups for students who have experienced trauma (Stewart & Thomson 2005). To avoid stigmatization, this group should have a name that is more empowering and potentially determined by the students who comprise the group. Third, schools can enact supportive school-based relationships (e.g. with community providers of mental health services), empower learners to connect with their communities to practice skills and build relationships, and intentionally create safe learning environments that empower student voice for students with trauma (Vaughan, 2002; Dods, 2013).

### ***Role of Technology in Personalized Learning***

As referenced in previous sections, current technology enables differentiated instructional approaches and individualized delivery systems (West, 2011). The specialized use of technology in

personalized learning environments can benefit historically underserved students (U.S. Department of Education Office of Educational Technology, n.d.). For decades, technology has been used to enhance teaching ELs; its benefits range from allowing students to watch and listen to recordings of people speaking English to providing opportunities for self-paced and differentiated lessons (Erben & Castañeda, 2009). In one of the few studies that directly examined the participation of ELs in personalized learning, researchers from the University of Massachusetts Boston studied the performance of ELs in a large, urban, student-centered high school. In this school, ELs received benefits such as access to differentiated content (including translated content), the ability to view and revisit instructional content at their own pace, access to differentiated and comprehensive support, and increased opportunities to learn and practice academic English (Carhill-Poza & Gounari, 2016).

Another study focused on the efforts of a blended-learning pilot program in a California Title I elementary school (where 80 percent of students were ELs), showed positive results from its “blended reading” intervention (Wilkes & Macaruso, 2016). In addition to traditional face-to-face interaction, blended reading allows for students to learn online, altering the speed with which vocabulary and content are delivered, and allowing students to learn at their own pace.

Assistive technologies are also shown to be beneficial for personalizing learning for SWDs, though these students may need additional assistance. Teachers and parents will require training to match student ability and needs to learning goals and to determine how technology can help achieve those goals (Hasselbring & Glaser, 2000). As is true with the student subgroups discussed previously in this paper, technology can be a critical tool to scaffold and support learning for SWDs but in and of itself does not offer a comprehensive approach to personalize learning. Technology offers the promise of adapting at scale to address individual learners’ needs but must be leveraged as a tool with an eye towards equity implications.

## CONCLUSION AND CONSIDERATIONS FOR FURTHER WORK

This paper provides an overview of research pertaining to personalized learning that addresses practice, policy, and systemic issues related to students of color, students in poverty, students dealing with trauma, English Learners, students with disabilities. Drawing on the existing peer reviewed academic literature, the most prominent conclusion is that there is a dearth of empirical research on how personalized learning can be used to serve these historically underserved students. The authors make a recommendation for further funding to be allocated to properly evaluate personalized learning at the school and district levels that explicitly addresses questions related to equity and access. Future research should take a task-oriented approach by collecting empirical qualitative data from successful practitioners and schools and quantitative data on best practices.

Despite the limitations of the research, this paper offers a few insights for readers to consider, including implications for policy and practice:

## *Policies to Improve Personalized Learning for Historically Underserved Students*

Historically underserved students can only benefit fully from personalized learning if federal, state, and local policies explicitly call for their inclusion, allow for their unique needs, and build on their strengths. Considering the limited extent of the literature review described above, below are a series of policy recommendations that could be used to enable personalized learning that is accessible to all students, in particular those who have been historically underserved:

- Policymakers should engage a range of stakeholders, including representatives and advocates of historically underserved students, in policy discussions related to personalized learning efforts, but also as normal practice, at all levels of government early and frequently in planning and decision-making processes.
- Policymakers, as well as locally-based decision makers, should consider how personalized learning systems will seamlessly meet the needs of historically underserved students.
  - For historically underserved students, policy-makers, advocates and partners should consider the logistics of ensuring equity in both access to opportunities to engage in high quality personalized learning and supports for personalized learning;
  - For ELs specifically, and historically underserved students broadly, various language and cultural needs (representation of characters, diversity in curricular materials, etc.) should be reflected in personalization efforts; and
  - For SWDs, we should consider how personalized learning systems can reduce the stigma of special education and enable students to meet high standards.
- One opportunity policymakers have is to set high quality standards and high expectations for learning outcomes for all students, and aligning their systems of continuous improvement and accountability to provide better information about access and outcomes. This might include consistent monitoring of access to rigorous learning experiences by student subgroup, consistent monitoring of the progress of all students, and providing just-in-time support to struggling learners through multi-tiered systems of support.
- Policymakers and system leaders should focus educator training on meeting the needs of students across a full range of differences to support their diverse challenges, by strengthening intensive pre-service teacher preparation programs that strengthen teachers' abilities and skills to successfully work with historically underserved students in personalized learning environments.

Personalized learning has the potential to help all students succeed, and it is important for policymakers to understand the bright spots of practice, policy, and research in order to make better informed decisions that support the implementation of personalized learning for historically underserved students. The above list of considerations is not exhaustive, and attempts to build on the limited research reviewed by the research team.

Ultimately, it is critical for policymakers to develop a vision for equity that is cross-cutting and addresses a full range of learning pathways, diverse student strengths, and student challenges.



State and federal education agencies should review laws, regulations, policies, and funding streams to ensure that historically underserved students can fully participate in personalized learning systems. Attention should be given to how personalized learning components align with other important frameworks in a state, district, or school, especially those that are in place to protect and support historically underserved students. Other factors for policymakers and practitioners to consider, which were not directly explored in this paper, are the complex structural barriers outside our school walls. These barriers include unequal distribution of school funding based on property tax values, racial segregation, and various dimensions of poverty – all of which intersect with efforts to personalize learning for historically underserved students.

## REFERENCES

- Abell, M. & Lewis, P. (2005). Universal design for learning: A statewide improvement model for academic success. *Information Technology and Disabilities Journal*, 11(1), <http://www.rit.edu/~easi/itd/itdv11n1/abell.htm>
- Achinstein, B., Ogawa, R. T., Sexton, D., & Freitas, C. (2010). Retaining teachers of color: A pressing problem and a potential strategy for 'hard-to-staff' schools. *Review of Educational Research*, 80(1), 71–107.
- Alliance for Excellent Education, National Council for Learning Disabilities, and National Council of La Raza. (2016). Webinar: Personalized learning: Meeting the needs of students with disabilities and English learners. Retrieved from <http://all4ed.org/webinar-event/may-4-2016/>
- August, D. & Hakuta, K. (1998). *Educating Language-minority Children*. Washington, D.C.: National Academy Press.
- August, D. & Shanahan, T. (2006). *Developing literacy in second-language learners: Report of the national literacy panel on language minority children and youth*. Washington, DC: Lawrence Erlbaum Associates; Center for Applied Linguistics.
- Averill, O. H., & Rinaldi, C. (2011). Multi-tier system of supports. *District administration*, 47(8), 91-95.
- Bailey, N. (2016, January 29). 21 Concerns about special education and competency-based education [blog post]. Retrieved from <http://nancyebailey.com/2016/01/29/21-concerns-about-special-education-and-competency-based-education/>
- Balfanz, R., Bridgeland, J. M., Fox, J. H., DePaoli, J. L., Ingram, E. S., & Maushard, M. (2014). Building a grad nation: Progress and challenge in ending the high school dropout epidemic. Annual Update 2014, *Civic Enterprises*.
- Berry, T. R., & Candis, M. R. (2013). Cultural identity and education: A critical race perspective. *The Journal of Educational Foundations*, 27(3), 43-64.
- Brown, J., & Doolittle, J. (2008). A cultural, linguistic, and ecological framework for response to intervention with English language learners. *Teaching Exceptional Children*, 40(5), 66-72.
- Carolan, J. (2016, February 24). Personalized learning isn't about isolation. *Education Week*. Retrieved from <http://www.edweek.org/ew/articles/2016/02/24/personalized-learning-isnt-about-isolation.html>
- Carter, P. (2005). *Keepin' It Real: School Success Beyond Black and White*. New York: Oxford University Press.
- Carhill-Poza A. & Gounari, P. (2016). Student-centered learning opportunities for adolescent English learners in flipped classrooms. Retrieved from Nellie Mae Education Foundation website: <https://www.nmefoundation.org/getattachment/Resources/Student-Centered-Learning/Student-Centered-Learning-Opportunities-For-Adoles/ELL-Flipped-Report-FULL.pdf?ext=.pdf>
- Center for Early Care and Education Research—Dual Language Learners (2011). *Social-Emotional Development in Dual Language Learners: A Critical Review of the Research* [Research

Brief #7]. Retrieved from [http://cecerdll.fpg.unc.edu/sites/cecerdll.fpg.unc.edu/files/imce/images/%232817\\_ResBrief%237\\_FinalRvsd-2.pdf](http://cecerdll.fpg.unc.edu/sites/cecerdll.fpg.unc.edu/files/imce/images/%232817_ResBrief%237_FinalRvsd-2.pdf)

- Chapelle, C. (2003). English language learning and technology: Lectures on applied linguistics in the age of information and communication technology. *Language Learning and Language Teaching*, v. 7. Amsterdam; Philadelphia: John Benjamins Pub.
- Childress, S. & Benson, S. (2014). Personalized learning for every student every day. *Phi Delta Kappan*, 95(8), 33–38.
- Chiu-Jung, C., & Pei-Lin, L. (2007). Personalized computer-assisted mathematics problem-solving program and its impact on Taiwanese students. *The Journal of Computers in Mathematics and Science Teaching*, 26(2), 105.
- Chuong, C. & Mead, S. (2014). *A policy playbook for personalized learning: Ideas for state and local policymakers*. Bellwether Education Partners. Retrieved from [http://bellwethereducation.org/sites/default/files/PolicyPlays\\_Final.pdf](http://bellwethereducation.org/sites/default/files/PolicyPlays_Final.pdf)
- Cunningham, M. (2016). Teaching social workers about trauma : Reducing the risks of vicarious traumatization in the classroom. *Council on Social Work Education*, 40(2), 305–17.
- Darling-Hammond, L. (2010). *The flat world and education: How America's commitment to equity will determine our future (multicultural education)*. New York: Teachers College Press.
- DeNisco, A. (2014). Navigating ConnectED and E-rate. *District Administration*. Retrieved from <https://www.districtadministration.com/article/navigating-connected-and-e-rate>
- DiPaola, M., Tschannen-Moran, M., & Walther-Thomas, C. (2004). School principals and special education: Creating the context for academic success. *Focus on Exceptional Children*, 37(1), 1-10.
- Dods, J. (2013). Enhancing understanding of the nature of supportive school-based relationships for youth who have experienced trauma. *Canadian Journal of Education*, 36(1), 71–95.
- Duncan, G. J., & Murnane, R. J. (Eds.). (2011). *Whither opportunity?: Rising inequality, schools, and children's life chances*. New York: Russell Sage Foundation.
- Echevarria, J., Vogt, M., & Short, D. (2000). *Making content comprehensible for English language learners: The SIOP model*. Boston, MA: Allyn and Bacon.
- Ellingson, J. (2012, July 2). Help or hinder: The impact of CBE for students with special needs [Blog post]. Retrieved from <http://www.competencyworks.org/reflections/help-or-hinder-the-impact-of-cbe-for-students-with-special-needs/>
- Erben, T., Ban, R., & Castañeda, M. (2009). *Teaching English language learners through technology*. New York: Routledge.
- Fairbain, S., & Jones-Vo, S. (2010). *Differentiating instruction and assessment for English language learners: A Guide for K-12 teachers*. Philadelphia: Caslon.
- Ferguson, A.A. (2000). *Bad boys: Public schools in the making of black masculinity*. Ann Arbor, MI: University of Michigan Press.

- Frankenberg, E., & Debray, E. (2011). *Integrating schools in a changing society: New policies and legal options for a multiracial generation*. Chapel Hill, NC: University of North Carolina Press.
- Friedlaender, D. et al. (2014). Student-centered schools: Closing the opportunity gap. *Stanford Center for Opportunity Policy in Education*. Stanford, CA. Retrieved from <https://edpolicy.stanford.edu/sites/default/files/scope-pub-student-centered-research-brief.pdf>
- Fuel Education and Middlebury Interactive Languages *Digital Curriculum* for ELLs. Retrieved from <http://www.getfueled.com/solutions/partners/ell>
- Fuchs, L. S., Fuchs, D., & Zumeta, R.O. (2008). Response to intervention: A strategy for the identification and prevention of learning disabilities. In E. G (Ed.) *Educating Individuals with Disabilities: IDEIA 2004 and Beyond*, (115-135). New York: Springer.
- Fulton County (SC) Public Schools Personalized Learning Roadmap.  
<https://www.fultonschools.org/en/divisions/acd/Documents/FCS%20Personalized%20Learning%20Roadmap%20Final%20v03102014.pdf>
- Gándara, P. (2015). The implications of deeper learning for adolescent immigrants and English language learners. *Students at the Center: Deeper Learning Research Series*. Boston, MA: Jobs for the Future.
- Gay, G. (2010). *Culturally responsive teaching: Theory, research, and practice* (2nd ed., Multicultural education series). New York: Teachers College.
- Gleason, S. C. and Gerzon, N. (2013). *Growing into equity: Professional learning and personalization in high-achieving schools*. Thousand Oaks, CA: Corwin.
- Grindal, T. (2016, January 14). The special education graduation gap [Blog post]. Retrieved from [http://www.huffingtonpost.com/todd-grindal/post\\_10880\\_b\\_8976972.html](http://www.huffingtonpost.com/todd-grindal/post_10880_b_8976972.html)
- Hall, T., Strangman, N., & Meyer, A. (2003). *Differentiated instruction and implications for UDL implementation*. Wakefield, MA: National Center on Accessing the General Curriculum
- Halle, T. G., Whittaker, J. V., Zepeda, M., Rothenberg, L., Anderson, R., Daneri, P., ... & Buysse, V. (2014). The social-emotional development of dual language learners: Looking back at existing research and moving forward with purpose. *Early Childhood Research Quarterly*, 29(4), 734-749.
- Hanover Research. (2012). Best practices in personalized learning environments (Grades 4 – 9). Retrieved from <http://www.hanoverresearch.com/media/Best-Practices-in-Personalized-Learning-Environments.pdf>
- Hasselbring, T. S., & Glaser, C.H.W. (2000). Use of computer technology to help students with special needs. *The Future of Children*, 10, 102 – 122.
- Haynes, J., & Zacarian, D. (2010). *Teaching English language learners across the content areas*. Alexandria, VA.: ASCD.
- Hornstra, L., Denessen, E., Bakker, J., van den Bergh, L., & Voeten, M. (2010). Teacher attitudes toward dyslexia: Effects on teacher expectations and the academic achievement of students with dyslexia. *Journal of Learning Disabilities*, 43(6), 515–29.

- Huang, C. S., Yang, S. J., Chiang, T. H., & Su, A. Y. (2016). Effects of Situated Mobile Learning Approach on Learning Motivation and Performance of EFL Students. *Journal of Educational Technology & Society*, 19(1), 263-276.
- Hughes, J., Herrington, M., McDonald, T., & Rhodes, A. (2011). E-portfolios and personalized learning: Research in practice with two dyslexic learners in UK higher education. *Dyslexia*, 17(1), 48-64.
- Hwang, G., Beyin, C., & Huang, C. (2016). Development and effectiveness analysis of a personalized ubiquitous multi device certification tutoring system based on Bloom's taxonomy of educational objectives. *Educational Technology & Society*, 19(1), 223–36.
- INACOL. (Producer). (2016). *Increase ELL success through blended and online social-emotional learning* [Video webinar]. Retrieved from <http://www.inacol.org/resource/increase-ell-success-through-blended-and-online-social-emotional-learning/>
- Individuals with Disabilities Education Act, 20 U.S.C. § 1400 (2004).
- Jenkins, J. M. & Keefe, J.W. (2002). Two schools: Two approaches to personalized learning. *Phi Delta Kappan*, 83(6), 449–56.
- Jobs for the Future & the Council of Chief State School Officers. (2015). *Educator competencies for personalized, learner-centered teaching*. Boston, MA: Jobs for the Future.
- Johnson, D. R., Thurlow, M.L., Schuelka, M. J. (2012). *Diploma options, graduation requirements, and exit exams for youth with disabilities: 2011 National Study* (Technical Report 62). Minneapolis, MN: University of Minnesota, National Center on Educational Outcomes.
- Jones, L. E., & Casey, M.C. (2015). *Personalized learning: Policy & practice recommendations for meeting the needs of students with disabilities*. National Center for Learning Disabilities. Retrieved from <http://www.nclld.org/wp-content/uploads/2016/04/Personalized-Learning-WebReady.pdf>
- Joyes, G. (2007). Personalized online learning: Exploiting new learning technologies. In H. Spencer-Oatey, (Ed.). (2007). *E-learning initiatives in China: Pedagogy, Policy and Culture* (Vol. 1, pp. 141-154). Hong Kong: Hong Kong University Press.
- Kim, C. (2012). The role of affective and motivational factors in designing personalized learning environments. *Educational Technology Research and Development*, 60(4), 563-584.
- KnowledgeWorks. (2016). New opportunities to advance personalized learning in the Every Student Succeeds Act (ESSA). KnowledgeWorks Foundation. Retrieved from <http://www.knowledgeworks.org/sites/default/files/ESSA-Opportunities-Advance-Personalized-Learning.pdf>
- Kozol, J. (1991). *Savage inequalities*. New York: Harper Collins.
- Kozol, J. (2006). *The shame of a nation: The restoration of apartheid schooling in America*. New York: Crown.
- Lazar, J. and P. Jaeger. (Winter 2011). Reducing barriers to online access for people with disabilities. *Issues in Science and Technology*, 27(2), 69-82.

- Lewis-McCoy, R. L. (2014). *Inequality in the promised land: Race, resources and suburban schooling*. Palo Alto, CA: Stanford University Press.
- Lewis, A, Chesler, M., & Forman, T. (2000). The impact of "colorblind" ideologies on students of color: Intergroup relations at a predominately White university." *Journal of Negro Education*, 69(1/2), 74–91.
- Massey, D. S. & Denton, N.A. (1993). *American apartheid: Segregation and the making of the underclass*. Cambridge, MA: Harvard University Press.
- Michigan Department of Education. (2015). Pupil Accounting Manual 5-O-B: Seat Time Waiver. Retrieved from [http://www.michigan.gov/documents/mde/5-O-B\\_SeatTimeWaivers\\_329678\\_7.pdf](http://www.michigan.gov/documents/mde/5-O-B_SeatTimeWaivers_329678_7.pdf)
- Moore III, J. L. (2005). Underachievement among gifted students of color: Implications for educators. *Theory Into Practice*, 44(2), 167–77.
- National Center for Learning Disabilities (NCLD). (n.d.). Personalized learning: Meeting the needs of students with disabilities: Key considerations from the research. Retrieved from [http://www.nclld.org/wp-content/uploads/2016/04/PL-KeyConsiderations.Fin\\_.pdf](http://www.nclld.org/wp-content/uploads/2016/04/PL-KeyConsiderations.Fin_.pdf)
- National Center for Learning Disabilities (NCLD). (2016). Policy & practice recommendations for meeting the needs of students with disabilities. Retrieved from <http://www.nclld.org/wp-content/uploads/2016/04/Personalized-Learning.WebReady.pdf>
- Ohio Credit Flexibility Plan (2010). Retrieved from <http://education.ohio.gov/Topics/Quality-School-Choice/Credit-Flexibility-Plan>
- Pane, J. F. et al. (2015). *Continued Progress: Promising Evidence on Personalized Learning*. Santa Monica, CA: RAND Corporation. Retrieved from [http://www.rand.org/pubs/research\\_reports/RR1365.html](http://www.rand.org/pubs/research_reports/RR1365.html).
- Patrick, S. et al. (2016). *Promising State Policies for Personalized Learning*. Vienna, VA: International Association for K-12 Online Learning (iNACOL).
- Pattillo-McCoy, M. (1999). *Black Picket Fences: Privilege and Peril among the black middle class*. Chicago: University of Chicago Press.
- Patrick, S. et al. (2016). *Promising state policies for personalized learning*. Vienna, VA: International Association for K-12 Online Learning (iNACOL).
- Personalized Learning: A working definition. 2014. Retrieved from <http://www.edweek.org/ew/collections/personalized-learning-special-report-2014/a-working-definition.html>
- The Pew Internet and American Life Project. (2007, April). Demographics of Internet users. Washington DC: Pew Research.
- Peyton, J.K., Moore, S.C.K, & Young, S. (2010). Evidence-based, student-centered instructional practices. *CAELA Network Brief*. Washington, DC: Center for Applied Linguistics.



- Phillips, K. (2015). What can we learn about personalized learning from individualized education plans?" Retrieved from <http://gettingsmart.com/2015/08/what-can-we-learn-about-personalized-learning-from-individualized-education-plans/>
- Pedro R. & Paredes, A. (2016). Educational reform, students of color, and potential outcomes. *High School Journal*, 78(4), 215–25.
- Ray, R. (2010). *Race and ethnic relations in the 21st century: History, theory, institutions, and policy*. San Diego: Cognella.
- Ray, R & Brown, J. (2015). Reassessing student potential for medical school success: Distance traveled, grit, and hardiness. *Military Medicine: International Journal of AMSUS*, 180(4), 138-141.
- Ray, R., Gilbert, K.L., & Sewell, A.A. (2016). Mobile technology as a conduit for reducing obesity-related health disparities. *Issues in Race & Society*, 4(1), 98-119.
- Ray, R., Fisher, D., & Fisher-Maltese, C. (2016). School gardens in the city: Does environmental equity help close the achievement Gap? *Du Bois Review*.
- Robinson-Cimpian J. P., Thompson, K.D., & Umansky, I.M. (2016). Research and Policy Considerations for English Learner Equity. *Policy Insights from the Behavioral and Brain Sciences*, 3(1), 129-137.
- Rose, D.H. (2000). Universal Design for Learning. *Journal of Special Education Technology*, 15, 67-70.
- Rose, D.H., & Meyer, A. (2000). Universal Design for Individual Differences. *Educational Leadership*, 58(3), 39-43.
- Rose, D.H., & Meyer, A. (2002). *Teaching every student in the digital age: Universal design for learning*. Alexandria, VA: ASCD.
- Sebba, J., Brown, N., Steward, S., Galton, M., & James, M. (2007). *An investigation of personalised learning approaches used by schools*. Nottingham: DfES Publications. Retrieved from [https://www.researchgate.net/publication/271963078\\_An\\_Investigation\\_of\\_Personalised\\_Learning\\_Approaches\\_Used\\_by\\_Schools](https://www.researchgate.net/publication/271963078_An_Investigation_of_Personalised_Learning_Approaches_Used_by_Schools)
- Semmel, M. I. et al. (1991). Teacher perceptions of the regular education initiative. *Exceptional Children*, 58(1), 9-24.
- Sewell, A. A. (2010). A different menu: Racial residential segregation and the persistence of racial inequality. Pp. 279–90 in *Race and Ethnic Relations in the 21st Century: History, Theory, Institutions, and Policy*, edited by R. Ray. San Diego, CA: Cognella Publishing.
- Stewart, D. & Thomson, K. (2005). The face your fear club: Therapeutic group work with young children as a response to community trauma in Northern Ireland. *British Journal of Social Work*, 35(1), 105–24.
- Summit Public Schools. Retrieved from <http://summitps.org/approach/results>
- Trainor, A. A., et al. (2008). From marginalized to maximized opportunities for diverse youths with disabilities: A position paper of the division on career development and transition. *Career Development for Exceptional Individuals*, 31, 56-64.

- United States Department of Education (USDOE). (2014). *Educational Environments for Students Ages 6 through 21 Served Under IDEA, Part B, Exhibit 27*. Retrieved from: <http://www2.ed.gov/about/reports/annual/osep/2014/parts-b-c/36th-idea-arc.pdf>
- U.S. Department of Education Office of Educational Technology. n.d. Learning: Engage and Empower. Retrieved from <http://tech.ed.gov/netp/learning-engage-and-empower/>
- Utley, C. A., & Obiakor, F.E. (2015). Special Issue: Research perspectives on multi-tiered system of support. *Learning Disabilities: A Contemporary Journal*, 13(1), 1-2.
- Vaughan, W. (2002). Effects of cooperative learning on achievement and attitude among students of color. *Journal of Educational Research*, 95(6), 359–64.
- Wang, F. (2008). International forum of educational technology & society content recommendation based on education-contextualized browsing events for web- based personalized learning. *Educational Technology & Society*, 11(4), 94-112.
- Webb, S. (2006, June). Can ICT reduce social exclusion? The case of an adults' English language learning programme. *British Educational Research Journal*, 32(3), 481-507.
- Wehmeyer, M. L. (2002). *Self-determination and the education of students with Disabilities*. Arlington, VA: ERIC Clearinghouse on Disabilities and Gifted Education.
- Wehmeyer, M. L., Martin, J.E., & Sands, D.J. (2008). Self-determination and students with developmental disabilities. Pp. 99-122 in H. P. Parette & G. R. Peterson-Karlan (Eds.), *Research-based practices in developmental disabilities*. Austin, TX: Pro-Ed.
- West, D. M. (2011). Using technology to personalize learning and assess students in real-time. Washington, DC: Brookings Institution. Retrieved from [https://www.brookings.edu/wp-content/uploads/2016/06/1006\\_personalize\\_learning\\_west.pdf](https://www.brookings.edu/wp-content/uploads/2016/06/1006_personalize_learning_west.pdf)
- Wilkes, S. & Macaruso, P. (2016). Second grade efficacy study: Lexia reading Core5 and DIBELS. Next Lexia Learning Systems, LLP.
- Wilkins, J., & Huckabee, S. (2014). *A literature map of dropout prevention interventions for students with disabilities*. Clemson, SC: National Dropout Prevention Center for Students with Disabilities. Retrieved from [http://www.transitionta.org/sites/default/files/effectivepractices/Dropout\\_Litmap\\_2014.pdf](http://www.transitionta.org/sites/default/files/effectivepractices/Dropout_Litmap_2014.pdf)
- Wu, T. T., Sung, T. W., Huang, Y. M., Yang, C. S., & Yang, J. T. (2011). Ubiquitous English learning system with dynamic personalized guidance of learning portfolio. *Educational Technology & Society*, 14(4), 164-180.
- Yang, T. C., Hwang, G. J., & Yang, S. J. H. (2013). Development of an adaptive learning system with multiple perspectives based on students? Learning styles and cognitive styles. *Educational Technology & Society*, 16(4), 185-200.
- Zare, S. (2011). Personalization in mobile learning for people with special needs. In C. Stephanidis (Ed.). *Universal access in human-computer interaction. Design for all and eInclusion* (pp. 662-669). Berlin Heidelberg: Springer.





One Massachusetts Avenue, NW, Suite 700  
Washington, DC 20001-1431  
voice: 202.336.7000 | fax: 202.408.8072