Quality Education for All: What the Research Tells Us

Report of a Literature Search for Generation All, November 2014

Opportunity gaps exist in Chicago schools, leaving many neighborhood public high school students without full access to the resources necessary for their academic and personal development. Generation All is focused on closing those gaps. The citywide initiative aims to unite communities and Chicago as a whole in creating a plan to ensure top-quality neighborhood public high schools that support students' personal development and learning, both in and out of the classroom, preparing them for success in life, college, and career.

Generation All's work consists of a collaborative, one-year planning process informed by robust community dialogue to develop a bold, community-owned plan that aims to ensure that all neighborhood high schools have the tools, resources, and supports to become educational anchors for all the young people in their community. This report, based on available knowledge and research about what that goal entails, provides a starting place for the initiative's efforts.

This summary report is derived from an extensive literature review, including reviews by researchers at Loyola University Chicago. It is organized around three main questions:

I. What do we know about high-quality education for adolescents?
II. What do we know about how to organize and support schools so they can provide a high-quality education?
III. What do we know about how school systems improve?

It should be clarified that, while this review is broad, it is neither exhaustive nor definitive. It should, however, provide a starting point and common knowledge base on which planners can build a solid design for educational support of all young people in the neighborhood high schools.

I. What Do We Know About High-Quality Education for Adolescents?

This section reviews what we know in general about high-quality schools and, more particularly, what is known about high-quality education for adolescents.

A. High-quality education is holistic

A high-quality education addresses and supports the holistic development of all students. Holistic education:

- Supports total development of a student's mind, body, and spirit
- Connects academic, intrapersonal, and interpersonal learning in a coherent way
- Links academic learning and cocurricular learning with authentic real-world experience

At the high school level, education must be grounded in what we know about adolescent development. High schools should foster adolescents' unique and growing abilities to think, learn, and engage with the world. In addition to rigorous and expansive learning opportunities in school, adolescents need critical supports and opportunities for learning in the world outside of school.

B. The adolescent development years provide unique opportunities and challenges

Adolescence is a critical and unique period of cognitive growth for youth as they develop the capacity for increased abstract thought and more expansive intellectual interests (American Association for Child and Adolescent Psychiatry, 2011). Fourteen- and fifteen-year-olds have the ability to consider future possibilities and considerations beyond present realities, which is a more typical focus of younger children (Canadian Department of Education (NF), 2001).

Researchers have documented that, among other dimensions and compared to younger children, adolescents have:

- Expanded intellectual interests
- Capacity for abstract thought
- Greater interest in their privacy
- Improved ability to use speech to express themselves
- Ability to develop ideals and select role models
- More consistent evidence of conscience
- Feelings of awkwardness about themselves and their bodies; worries about being normal
- Increased interest in how their peer group influences them
- Strong desire for independence
- Struggles with a sense of identity (American Association for Child and Adolescent Psychiatry, 2011).

C. Programming in high-quality schools addresses all aspects of students' development

High-quality high school education attends to the intellectual development of adolescents both during the school day and after school. It consists of academic programs based on a broad and deep curriculum, holds to new standards of excellence for all, and includes cocurricular activities. In addition, a high-quality high school education addresses students' physical, emotional, and social needs through programs and instructional strategies in and out of the classroom that are designed to develop their intrapersonal and interpersonal skills as well as to provide opportunities for developing physical and creative talents.

While these are important issues in all learning environments, they have particular relevance in the lives of adolescents. As they make the transition from middle to high school, students are adapting to increased academic demands while they are learning to navigate a more complex social environment (Barber & Olsen, 2004).

Many entering ninth-graders need support as they adjust to the rigor and independence of high school. The structure of high school involves students being taught by more than one teacher. Freshmen are

often typically in classes that are larger than what they experienced earlier in their schooling. In addition, for many, their peer communities are widened, and coursework involves taking more responsibility, exercising more independence, and self-monitoring (Schiller, 1999). These challenges are compounded by the fact that students are simultaneously dealing with significant physical and developmental changes and new vulnerabilities.

1. **Quality high schools offer a deep and broad academic curriculum**

   "Deeper learning" refers to the skills and knowledge that students must gain to succeed in 21st century jobs and civic life. The foundation of deep learning is mastery of core academic content, whether in traditional subjects, such as mathematics, or in newer interdisciplinary fields, such as ecological studies, coupled with the experience of applying that knowledge. Deep learning activities need to build upon a clearly defined knowledge base to which students have been exposed previously, or to which they will be introduced systematically in the context of their academic work (Schneider & Vander Ark, 2013).

   Deep learning occurs when learners routinely use higher-order cognitive skills, such as analysis, synthesis, problem-solving, and describing their own thinking (metacognitive thinking) to develop understanding of concepts and ideas. This kind of learning promotes long-term retention of knowledge and understanding of how to learn (Parsons & Beauchamp, 2012).

   Deep learning also enables individuals to take what was learned in one situation and apply it to new situations. The by-product of deep learning is transferable knowledge, including content knowledge in a subject as well as procedural knowledge about how, why, and when to apply that knowledge to solve new problems and address new questions. Deep learning involves three intertwined areas of human development: Cognitive (e.g., reasoning, creating, and remembering); Intrapersonal (e.g., being self-aware, self-regulating, being persistent) and Interpersonal (e.g., interacting with others, collaborating, listening, expressing ideas, and responding to those of others).

   Education involves the simultaneous development of all three arenas of human development. Evidence is emerging that all three are required and implicated in the skills required for successful lives in the 21st century. All three competencies are implicated to one degree or another in the new standards and need to be supported to promote effective learning and knowledge transfer (Pellegrino & Hilton, 2014).
   In addition to opportunities to pursue interests and deep knowledge in specific subjects, students need exposure to many fields and ways of knowing, including through the lenses of the sciences, arts, humanities, and culture. Deep and broad learning are mutually interactive and each enhances the other. Depth and breadth of understanding of the world contribute to

independent thinking and a love of learning. Experts believe that high-quality education consists of both general knowledge and detailed understanding—depth and breadth (Egan, 2011).

2. Quality high schools support intrapersonal and interpersonal development of adolescents

Adolescents have increased need for supports as they undergo significant changes in their social (interpersonal) and emotional (intrapersonal) development.

- **Adolescent years provide opportunities for enhanced development of young people's understanding of themselves as learners**

Intrapersonal learning involves metacognition—awareness of one's own thinking or others' thinking—an important aspect of children's learning (Brown, 1978); (Flavell & Wellman, 1977). It includes knowledge about learning, knowledge of one's own learning strengths and weaknesses, and consciousness of the demands of the learning task at hand. Intrapersonal learning also includes self-regulation—the ability to orchestrate and plan one's own learning, monitor success, and correct errors when appropriate—all necessary for effective intentional learning (Bereiter & Scardamalia, 1989). In short, students need to develop the ability to teach themselves and become lifelong learners. The period of adolescence is characterized by enhanced capacity to think metacognitively, thus providing increased opportunities for high schools to strengthen this capacity of young people (National Research Council & Institute of Medicine, 2004).

- **Success in school is linked to students' interpersonal and intrapersonal development**

Research indicates that social and emotional development is correlated with adolescents' success in school:

- Studies find that emotional knowledge and regulation—understanding or labeling one's own emotions and accurately identifying the emotions of others—predicts academic achievement. Emotional knowledge mediates the relationship between verbal ability and academic competence (Izard et al., 2001); (Trentacosta & Izard, 2007).
- The influence of caring teacher-student and student-student relationships in academic success and in encouraging commitment to school has been well-documented (Blum & Libbey, 2004); (Hamre & Pianta, 2006); (Hawkins et al., 2004); (Jennings & Greenberg, 2009); (Durlak et al., 2011).
- When students are self-aware and confident about their capacity to learn, they tend to persist in the face of challenges (Aronson, 2002); (Durlak et al., 2011).
- When students have high expectations of themselves, set high academic goals, have self-discipline, motivate themselves, and manage stress, they tend to have better academic success (Duckworth & Seligman, 2005); (Elliot & Dweck, 2005); (Durlak et al., 2011).
- Students who use problem-solving skills to overcome obstacles and make responsible decisions about studying and completing homework do better academically (Zins & Elias,

2006); (Durlak et al.,2011).

Research continues in this area, and educators are raising awareness of this facet of high-quality education as an integral aspect of creating successful learning environments for young people (Farrington et al., 2012); (Partnership for 21st Century Skills, 2009); (Bayerl et al., 2014).

The Common Core State Standards call for deep and broad learning goals for all students

New, rich, and rigorous standards for learning are currently being put in place across the nation to ensure that all students develop greater knowledge, skills, and problem-solving capacities. Common Core State Standards offer an increased focus on deep learning, and emphasize the ability to analyze, synthesize, and explain ideas. Common Core State Standards for mathematics and for language arts have been adopted in Illinois and will be assessed statewide during the 2014–15 school year. The Next Generation Science Standards, released in 2013, were adopted by Illinois in 2014 with system-wide assessments expected to be in place by 2015–16. These new standards define in detail what conceptual understanding and skills all students should develop in language arts, mathematics, and natural sciences throughout their elementary and secondary schooling.

3. Quality high schools support adolescents' physical development and mental health

Early adolescence is a period of accelerated physical development and changing social and emotional needs (American Association for Child and Adolescent Psychiatry, 2011); (National Institute of Child Health & Human Development; National Council for the Accreditation of Teacher Education, 2005, 2006). Physical and mental health are well-documented as necessary components of student well-being at both the international and local levels (United Nations International Children's Emergency Fund, 2000); (Eccles & Gootman, 2002). A holistic approach to education attends to these health needs. The need for this approach is particularly important for students in communities that lack health care and other resources and for families who have not traditionally used preventative health care. Schools play a critical role in promoting the health and safety of young people and helping them establish lifelong healthy behaviors.

- **Studies show that the academic achievement of America's youth is strongly linked with their health**

- Health-related factors such as hunger, physical and emotional abuse, and chronic illness can lead to poor school performance.
- Health-risk behaviors such as early sexual initiation, violence, unhealthy eating, and physical inactivity are consistently linked to poor grades, test scores, and lower educational attainment.
- Research also has shown that school health programs can reduce the prevalence of health-risk behaviors among young people and have a positive effect on academic achievement. (http://www.cdc.gov/healthyyouth/health_and_academics/index.htm) (Centers for Disease Control and Prevention 2012).

Attention to student health and physical well-being can range from prevention to intervention and may include curricular, cocurricular, and facilities strategies for ensuring a healthy environment, promoting a healthy lifestyle, and addressing immediate health care needs.

Supporting all students, including English-language learners

The Common Core State Standards provide an opportunity to implement significant changes to the way in which English-language learners are served in American schools and to improve their educational outcomes. For children entering school with little or no English, there is a pivotal role for teachers of English as a second language to develop students' initial English language, both social and academic. Development of the academic uses of language is the responsibility of every teacher. This will require a different level of expertise than currently exists among most teachers.

English-language learners are the most rapidly growing group of students and are also a very diverse group. Consequently, teachers need to pay attention to the variation in students' needs both within the group and compared to native English speakers. Research shows that teachers who successfully support these students understand that:

- Learning builds on prior knowledge and experience, and teachers build on that knowledge to help students access school learning.
- Language and cognition develop together and progressively. As ideas and relationships become more complex, so does language.
- The goal of learning is for students to develop the ability to use independently what they have learned previously as participants in their learning community.
- The goal of language use is to make it contextually appropriate; students need to develop a linguistic repertoire that allows them to vary their written and spoken use of language depending on the context and on their purposes.
- Formative assessment is integrated into the process of teaching and learning (Walqui & Heritage, 2012).

Supporting all students, including those with individualized needs

Some students need very specific individualized educational plans. For example, the Individuals with Disability Education Improvement Act and other legislation requires that disabled children and young adults be provided access to a challenging education curriculum to prepare to live independent adult lives (Office of Civil Rights, 2011). Students with disabilities are to be taught to general academic content standards, which are age-appropriate, engaging, and challenging. The definition of "appropriate" has been uncertain, but standards of quality have become more consistent and stringent over time (Blau, 2007).

While many are taught using the same good instructional practices mentioned above and assessed on their learning using general education assessments, others may need some accommodations for their disability, including alternative assessments and additional individually tailored instructional practices (National Alliance for Secondary Education and Transition, 2005); (Quenemoen, 2011).

Review of the research on inclusion of students with disabilities in general education classrooms finds that the impact on their academic and social development has been mixed. One reason cited for this is the extent to which the general education system and teachers are able to accommodate student needs and differentiate instruction accordingly (Salend & Duhaney, 1999). Providing supports for teachers who work with special needs children is important and one means for doing this is peer support (Boyle, Topping, Jindal-Snape, & Norwich, 2012).

The requirement of the Common Core State Standards that all students—including those with disabilities—meet more rigorous grade-level expectations, presents both an opportunity and a challenge for schools to provide the necessary instructional supports for these students and their teachers.

4. Quality high schools provide a supportive school climate

Studies show that a positive school climate fosters development and learning. Such a climate includes norms, values, and expectations that support all people in the school feeling socially, emotionally, and physically safe. In a supportive climate, people are engaged and respected, and students, teachers, and families work together with a shared school vision. Educators model and nurture an attitude that emphasizes the benefits and satisfaction of learning. Each person contributes to the operations of the school as well as the care of the physical environment (Thapa et al., 2013). How students perceive their school's racial climate is associated with student achievement, college preparation, behavior, and sense of community (Thapa et al., 2013).

Safe and orderly environments that encourage and reinforce positive classroom behavior have been identified as necessary conditions for academic achievement (Marzano et al., 2005).

An important aspect of school climate is how connected students feel to each other. In general, when high school students have strong school peer relationships, they have a better foundation for their social, emotional, and academic learning.

- **Collaborative learning creates community**

Adolescent students need opportunities to articulate ideas, work in groups, interact, lead, follow, and collaborate. Systematic reviews and meta-analyses of over four decades of research on collaborative learning strategies show consistently positive results. They appear to work well for all ages if activities are suitably structured for learners' capabilities. Approaches that promote talk and interaction among students tend to produce the best gains (Sutton Trust Education Endowment Foundation, 2013).

Collaborative learning helps create a community of students who are responsible for one another's learning, rather than a competitive environment, which can be alienating for some (Cohen, A., 1994).

Research on collaborative learning shows:

- Most students enjoy working together (Davidson & Phelan, 1999); (Johnson & Johnson, 1985); (Mitchell, 1993); (Evans, 1989).
- Students are more receptive to challenging assignments when they can work in groups rather than work in isolation.
- Group problem-solving may be superior to individual problem-solving (Evans, 1989); (Newstead & Evans, 1995).
- Making arguments and interacting with peers may help develop a student's thinking (Goldman, 1994); (Habermas, 1990); (Kuhn, 1991); (Moshman a, 1995); (Moshman b, 1995); (Salmon & Zeitz, 1995); (Youniss & Damon, 1992); (Kobayashi, 1994).
- Feeling included and respected in a community of peers has been found especially to matter to students with special needs and students who are learning English as a second language (Thapa et al., 2013); (Higgins-D'Alessandro & Skwarawich, 2011); (Walqui, 2000).

In addition, collaborative work also can help students learn to cooperate, creating a setting where novices can contribute what they are able and learn from those more expert than themselves. The new Common Core State Standards also implicate the need for increased opportunities for all students to articulate ideas, create arguments, and solve authentic complex problems. Purposeful collaborative learning activities support opportunities for discussion, listening, shared thinking, and expansion of ideas.

What does collaborative learning look like?

One challenge to successfully implementing collaborative learning is the inherent status inequity that arises in the social system of the classroom (Cohen, K.C., 1997). Cohen and Lotan address these "status conditions" of students in the underlying principles of "complex instruction"—a model of pedagogy that involves students actively and equitably in meaningful, challenging group work. These principles include:

- Constructing tasks that are open-ended,
- Incorporating multiple intellectual abilities,
- Bolstering group interdependence and enforcing individual accountability, and
- Connecting activities through central concepts of the discipline under study (Cohen & Lotan, 1997).

5. Quality high schools include learning supports beyond academic coursework

➢ **Extracurricular activities are linked to learning success**

Research on extracurricular activities indicates that they are positively linked to learning outcomes in a number of ways. In addition, extracurricular programming is particularly beneficial to students with fewer opportunities for such learning opportunities (Everson & Millsap, 2005).

Research also shows a relationship between student extracurricular participation and academic engagement:

- Students' classroom engagement is related to their participation in activities, especially among those from low-income families.
- Activities help students build supportive relationships among peers and adult staff, a key component in classroom engagement and college aspiration.
- Structured activity programs create peer groups with higher aspirations and more commitment to academic success.
- Extracurricular programs help promote healthy physical, psychological, emotional, and social health (Center for Comprehensive School Reform, 2007).

Participation in certain extracurricular activities—athletics and fine arts—significantly reduces the likelihood of a student's dropping out (Eccles, J. S., & Barber, B. L.); (McNeal, 1995).

➢ **Family and community engagement are integral to students' success**

Students' home lives as well as the lives of their families and neighbors also contribute to students' success. To be able to benefit from high-quality instruction and to experience overall

success during high school, students need supports that extend well beyond classroom walls, including family and community engagement.

The community around students is integral to their success in high school and beyond. Improvements in students' environments are found to increase stability (financial, emotional, and physical/health) and positively impact school success and achievement of long-term career and academic goals (Schweinhart et al., 2005); (Currie, 2009). A vital community—one with stable health, financial, and safety resources— can ensure a vital school environment and vice versa. This relationship occurs at a variety of levels: student, parents, school, neighborhood, city, and beyond. This is especially true for urban schools (Warren, 2005).

Implications and challenges for schools offering high-quality education

1. For schools to offer high-level academic goals and expectations for all students, school personnel must engage in departmental teamwork and interdepartmental planning. This requires significant time and work arrangements to support such collaborative work.
2. To connect with each student, teachers and schools must also pay attention to individual needs and development. Culturally responsive teaching and attention to individual learning needs require major shifts in teaching as well as teachers acquiring new knowledge and skill.
3. To offer multiple opportunities for learning inside and outside the school, significant new flexibilities may be required in framing and scheduling of courses, internships, and extracurricular and cocurricular activities

II. Improving Schools: What Do We Know About How to Organize and Support High Schools So They Can Provide a High-Quality Education?

Successful improvement of education necessitates continuous learning and development by the school and the system of which it is a part. Educational systems and schools that improve typically provide opportunity for continuous knowledge building, in particular to strengthen instructional programming. School personnel work continuously on strengthening curriculum and instruction, the overall climate and environment of the school, supports for individual students, and integration of students' learning opportunities with the community and world beyond the school.

Research continues to explore effective ways to organize high schools and supportive community systems. There is compelling research on the need for empowered teachers and effective administrators if high schools are to lead the effort of providing high-quality education to all students. Professional teams are at the core of successful schools, as demonstrated consistently by research on high-performing systems nationally and internationally. Those teams work internally, across schools in professional networks, and with families and civic communities to coordinate support for students' education.

A. School personnel are at the center

Schools need strong staffing at all levels and positions to support youth effectively as they develop from early adolescence to young adulthood. Quality schools have knowledgeable and skilled staff who believe in students, a collegial work environment, time for continuous development of teachers, qualified nonteaching staff adequate to meet student needs, and effective leadership.

High-quality high schools have been found to have:

- Teachers with specific knowledge, skills, and beliefs
- Teachers engaged in high-quality continuing professional development and professional communities that support and build their expertise
- Principals and teachers with specific knowledge, skills, and beliefs to carry out their leadership roles
- Appropriate staff members in sufficient numbers to support students' needs

1. Strong teachers have a wide range of knowledge and skills

- **Pedagogical content knowledge and subject matter expertise**

To provide quality instruction, teachers not only need knowledge of the content they are teaching but also pedagogical content knowledge, a concept introduced by Shulman in 1986. This includes knowing what teaching approaches fit the content and how elements of the content can be arranged for better teaching. Additional findings include:

- In general, high levels of subject matter knowledge were positively correlated with effective teaching practices, such as the use of hands-on and laboratory activities, decreased dependence on texts, better ability to plan and carry out lessons, and higher comfort levels with facilitating student discussions (Abell & Lederman, 2007).

- Research has shown the importance of pedagogical content knowledge in the subject of mathematics, particularly in elementary school. Math education research findings conclude that this knowledge can be increased through professional development programs, that it influences the way teachers teach, and that it has a positive influence on student achievement (Hill et al., 2005).
- Math teachers need to learn content in ways that are relevant to the classroom to be effective in increasing student achievement (Cohen & Hill, 1998).
- Students of teachers who have received training on subject-specific teaching and learning tend to perform better. The extent to which student teachers receive training in the knowledge base on subject-specific teaching and learning and how to apply that knowledge positively correlates to how well their students learn and achieve (Darling-Hammond et al., 2005); (National Council for Accreditation of Teacher Education, 2010); (Wilson et al., 2001).

➢ **Understanding how students learn**

Teachers need not only a deep understanding of the content they teach but also an understanding of how students learn and develop, how to assess student comprehension, and how to engage all students to improve achievement. These concepts are embodied in teacher education standards and supported by research (NCD, 2003). It is important for high school teachers to understand how adolescent development impacts learning.

Effective teachers continuously do real-time monitoring of both group work and individual performances, and attempt to assess students' abilities to link their current activities to other parts of the curriculum and their lives. They can give students formal or informal feedback. Much teacher feedback—grades on tests, papers, worksheets, homework, and on report cards—represents summative assessments intended to measure the results of learning. In comparison, formative assessment is ongoing assessment designed to make a student's thinking visible to both the teacher and student. This can increase a student's learning and knowledge transfer, and the student learns to value opportunities to revise his or her thinking about a topic and approach to learning about the topic (Barron et al., 1998); (Black & William, 1998); (Vye, 1998).

Formative assessment includes teachers' comments on work in progress, such as drafts of papers or preparations for presentations. The assessments permit teachers to grasp the students' preconceptions, understand where the students are in the "developmental corridor" from informal to formal thinking, and design instruction accordingly. Unfortunately, many standardized tests used for accountability overemphasize memory for isolated facts and basic skills, and teachers are often judged by how well their students do on such tests. The goal of effective learning includes understanding and, therefore, assessments must tap understanding rather than merely the ability to repeat facts or perform isolated skills (National Research Council & Institute of Medicine, 2004).

Appropriately designed assessments can help teachers realize the need to rethink their teaching practices (Redish, 1996); (Bransford, 1998). Assessments should be learner-friendly, provide students with opportunities to revise and improve their thinking (Vye, 1998), help students see their own progress over the course of weeks or months, and help teachers identify problems

that need to be remedied. Effective formative assessment tools have been created and studied in writing, science, and mathematics (Leonard et al., 1999); (Lehrer & Schauble, 1996); (Wiske, 1997); (Wolf, 1988).

- **Belief in all students as learners**

While teachers' technical knowledge of what they teach is critical, their knowledge and expectations of those whom they teach is of equal importance. Educators' expectations affect student outcomes because of the way that teachers behave toward different students. From elementary through postsecondary schools, researchers have concluded that high expectations positively influence students and that teachers communicate differently with students whom they believe are more capable than they do with students they believe are less capable (American Association of State Colleges and Universities, 2005); (Good & Brophy, 1997). The most sizable effects of low teacher expectations appear when these expectations lead students to perform even worse than otherwise predicted (Babad, 1998). Expectations can impact students as individuals, within classrooms, within schools, and as members of ethnic or gender groups (Good & Brophy, 1997).

One expectation has to do with teacher beliefs about innate intelligence. Studies suggest this belief can affect a teacher's own level of achievement as well as how a teacher treats students. For example, teachers who believe intelligence is fixed and cannot be changed by behavior emphasize that failure is an obstacle to be overcome. Teachers who believe intelligence can be changed think of failures as learning opportunities and emphasize effort and strategy with their students (Dweck, 2000); (Garcia-Cepero & McCoach, 2009); (Lee K. , 1996); (Stipek & Gralinski, 1991).

Schools must offer high-level academic goals for all students, including students with disabilities, English language learners, and students with behavior problems or other challenges. The Common Core State Standards, which articulate rigorous grade-level expectations in the areas of mathematics, English language arts, and science, apply to all students.

- **Sense of efficacy**

Teachers' self-efficacy—belief in their own abilities to promote their students' learning—has been the focus of much research that strongly supports its importance. Teachers' self-efficacy has been related to teachers' efforts to plan, organize, and persevere as they work to improve their instructional practices (Berman P. , McLaughlin, Bass, Pauly, & Zellman, 1977); (Guskey, 1984); (Ghaith & Yaghi, 1997) and to their students' achievement and motivation (Saklofske et al., 1988); (Midgley et al., 1989); (Milner & Hoy, 2003).

2. **Strong teachers participate in high-quality continuing professional development and professional communities**

➢ **Time for continuous development**

Advocates for effective professional development see it as "a process, not an event" (Guskey, 1995). This is consistent with other research that shows professional development sustained over time, when aligned with standards-based curricula, can positively impact student achievement at a school (Cohen & Hill, 1998); (Kannapel & Clements, 2005); (Wenglinsky, 2002). Researchers have found that professional development programs that are cursory, one-time events, or that provide training prior to implementation of a reform are not very effective (Berman & McLaughlin, 1978).

Numerous studies have identified features of professional development programs that make a difference in teachers' teaching and students' learning (Darling-Hammond & McLaughlin, 1995); (Garet et al., 2001). Darling-Hammond & Richardson offer a concise list of what the research literature supports as high-quality professional development:

- Deepens teachers' knowledge of content and how to teach it to students
- Helps teachers understand how students learn specific content
- Provides opportunities for active, hands-on learning
- Enables teachers to acquire new knowledge, apply it to practice, and reflect on the results with colleagues
- Is part of a school reform effort that links curriculum, assessment, and standards to professional learning
- Is collaborative and collegial
- Is intensive and sustained over time (Darling-Hammond & Richardson, 2009, p. 49).

➢ **Professional learning communities**

Learning communities engaging teachers in professional development that share five key characteristics have become known and studied as "professional learning communities" (PLCs). These groups have the following essential characteristics:

- Shared values about the school's priorities and about students' ability to learn
- A focus on student learning (rather than on teaching)
- Reflective dialogue among teachers about classroom and student learning
- Making their teaching "public" by opening their classrooms to colleagues and others
- Collaboration (Newmann, 1996).

Studies of professional learning communities, including high school teacher learning communities, provide promising evidence that teacher practice and student achievement can improve when teachers are engaged in professional learning communities. This improvement depends not only on the presence of a PLC but on its fidelity to the essential characteristics (Louis & Marks, 1998); (Vescio et al., 2007).

3. Leadership is exercised by both teachers and principals

Leadership at the school level has been shown to influence the success of a school and is key to the process of becoming successful. For example, the 2009 Achievement Gap Initiative conference brought together 15 public high schools that had recently narrowed their achievement gaps. Project researchers looked at the leadership teams that led the school change efforts and found common steps in which school leaders:

- Accepted their responsibility to lead the change process
- Stated the purposes of the work in mission statements that focused on a few key ideas and priorities that stakeholders could understand and embrace
- Designed strategies, plans, capacity, and incentives for broadly inclusive adult learning
- Developed and refined quality standards for judging teacher and student work
- Skillfully and relentlessly implemented plans, monitored quality, and provided appropriate supports and incentives (Ferguson et al., 2010).

➢ Teacher leadership

The leadership role is one aspect of teachers' work that is raised both to increase teachers' commitment by offering them career ladders and to benefit students. Since the 1980s, it has become more common to create formal teacher leadership roles, including using teachers as instructional coaches, as ways to encourage them to continue in the teaching field and to improve instruction and student learning.

"Distributed leadership" is a framework to focus on how multiple individuals in formal and informal positions carry out leadership roles in schools and consider the interactions of all of these individuals in the context of their work in order to understand educational leadership and its role in the effectiveness of schools (Spillane et al., 2001); (Spillane & Diamond, 2007); (Neumerski, 2012). While some recent studies have begun to explore how different leaders support each other and make mutual contributions in high-performing schools, it remains unclear how principals, teacher leaders, and instructional coaches interact to improve instruction. Further examination is needed of this area as well as of how the context at the school, district, state, and national levels affect this leadership (Neumerski, 2012).

➢ Principal leadership

Studies show that principal leadership influences the likelihood that a school will make positive improvements. School principals who work effectively with schools that improve their school's success do so by carrying out activities that support their teachers with coherent instructional resources, goals, and professional development. Studies find that principals with an instructional focus are more likely to help schools to improve student achievement (Fullan, 2011); (Fullan & Knight, 2011).

There are many studies linking principals' leadership in indirect but small positive, significant ways to student learning, especially in lower socioeconomic schools (Hallinger & Heck, 1996); (Leithwood & Jantzi, 2008); (Supovitz et al., 2010); (Neumerski, 2012). Principal leadership is

believed to work if it attends to teachers' capacities: selecting instructors and then helping them develop their pedagogical content knowledge, supporting professional communities and giving them opportunities for high-quality professional development. Leaders also support student learning by aligning district goals with actions and resources (Brewer, 1993); (Fullan et al., 2005); (Leithwood et al., 2004). Studies have identified different facets of principal leadership in successful schools (Cotton, 2003).

A meta-analysis of the leadership research from the 1970s to 1990s found various types of leadership practices significantly associated with student achievement. The study showed that the most important variables of effective leaders are focusing on the right school or classroom practices impacting students and understanding the magnitude of the change they wish to lead (Marzano, Waters, & McNulty, 2005); (Waters, Marzano, & McNulty, 2003). A study of Chicago high schools found that strong principal leadership and positive learning climate were associated with schools with stronger instruction and student achievement. Within these high schools there was evidence that principal leadership correlated with student success through how it shaped the professional communities and development of teachers (Sebastian & Allensworth, 2012).

4. Staffing beyond teachers is critical to support students' needs

While there is much less research directly measuring the impact of nonteaching staff on high school students, there is some evidence to suggest that the numbers and qualities of these staff members are important to consider when organizing for high-quality education. Studies indicate that having more high school counselors can positively impact college application and attendance (Bryan et al., 2011); (Hurwitz & Howell, 2013). Studies of school social workers in urban high schools have found a statistically significant reduction in various risk factors related to truancy among students who received an intervention by social workers.

In addition, research on what comprises successful programs to support students at risk of dropping out describes interventions that require attention to the complexity of influences on students—and thus require the guidance of specific staff at the school, such as social workers; coaches; and music, drama, and other arts staff.

B. Additional supports and conditions

Schools also need support that bolsters students' learning and development, and critical roles are played by many others in the lives of students. These supports and the ecosystem around students are multiple, and research validates the importance of students' family and multiple players from the community that surrounds them.

1. Family and community supports are vital components of young people's education

How families engage with their high school student has clear impacts on students' feelings, behaviors, success in school, and peer interactions. School success can also be influenced by how families feel about and engage with the school systems serving their children. Parents' high expectations matter to students, so it is important to enlist them in ensuring their students'

success (Henderson & Mapp, 2002). Creating a balance between parents and other education stakeholders that is equitable, inclusive, and culturally sensitive is important in eliciting parental support in education (Fine, 1993); (Delpit, 1988). Parental involvement is considered beneficial at all educational levels, from elementary through high school (Miedel & Reynolds, 1999).

The community around students is integral to their success in high school and beyond. Improvements in students' environments are thought to increase financial and emotional stability, improve physical health, and positively impact school success and achievement of long-term career and academic goals (Schweinhart et al., 2005); (Currie, 2009). A vital community—one with stable health, financial, and safety resources—can ensure a vital school environment and vice versa.

Many resources outside of the school and within the community support high-quality education. These include:

- Other educational institutions such as colleges and universities that provide preparation and in-service professional development for teachers and other staff
- Government agencies and policies that shape certification requirements for educators, graduation requirements for students, and allocated resources for schools
- Colleges, adults, and peers who build and support college-going aspirations and success
- Businesses, career and technical educators, adults and peers who build and support job training and successful transitions
- Individuals and groups that play a critical role in addressing the needs of students at risk of dropping out, for example: adult volunteer mentors, child protective services, community mental health agencies, state or local government agencies that provide financial assistance to needy families, churches or community organizations, health clinics or hospitals (Carver & Lewis, 2011).

Emerging models of comprehensive community support

Locally targeted community initiatives include comprehensive neighborhood programs often modeled on the Harlem Children's Zone in New York City. These programs expand on the wraparound approach with more cradle-to-career solutions that support not just the students but the wider adult community. The research on these efforts is just emerging. However, one clear lesson is that when undertaking these initiatives, it is critical to first know a community's resources and capacity before implementing change (Levine & Wilson, 2013); (Bayerl et al., 2014).

2. Supportive and safe climates in and outside the school are key

Social scientists describe physical safety as "one of the active ingredients in community programs that facilitate positive youth development" (Eccles & Gootman, 2002). Like physical and mental health, this is acknowledged throughout the world as essential to a young person's well-being (United Nations International Children's Emergency Fund, 2000). Although there is significant variability in how children react to exposure to violence in the home or community, it

can impact both their physical and mental health, (Margolin & Gordis, 2000). Violence can suppress students' desire to learn and also make the endgames of learning—college, career, productive citizenry—appear less attainable.

Children who do not feel safe getting to school may experience anxiety throughout the school day (Milam, Furr-Holden, & Leaf, 2010). Bowen and Bowen report on research that suggests some children may not even undertake the trip to school because of fear for their safety on the way to school or at the school, cutting these students out of academics entirely. Students' preoccupation or experience with safety issues affects academic performance because it can affect "psychological states such as school motivation, satisfaction, or future orientation" (Bowen & Bowen, 1999).

Bullying negatively impacts how students experience school. The exact prevalence of bullying is difficult to measure given a lack of consensus on its definition and varied ways of assessing it. In general though, researchers see bullying student interactions as a type of aggression that is repeated over time within a relationship with an imbalance of power so that the bullied person finds it difficult to defend against the aggression. Bullying relationships are complex and involve the individual's characteristics and their ecological context within families, schools, and communities (Espelage & Swearer, 2003).

A framework of essential supports and contextual resources for school improvement

The University of Chicago Consortium on Chicago School Research has developed a set of five essential supports and contextual resources important for school improvement. While the focus of the essential supports was originally developed after researching public elementary schools, these supports are applicable to many different types of schools.

Leadership is the first essential support and serves as a catalyst for change. Having strong leadership can promote and propel the remaining four essential supports. Parent-community ties and professional capacity are both related to the collective and individual capacities of adults, which in turn strengthen the learning climate and instruction. The five essential supports are listed below:

1) Leadership Acting as a Catalyst for Change
2) Parent-Community Ties
3) Professional Capacity
4) Student-Centered Learning Climate
5) Ambitious Instruction

Source: The University of Chicago Consortium on Chicago School Research

3. High school structures and contexts are unique and require unique attention

Many ways of arranging high schools and programs within them have been attempted over the last several decades. The qualities of the implementations and the extent of their successes vary.

Since there is limited quality research documenting the success of specific models, it is important also to examine some of the emerging and new research on high schools. After reviewing specific models, Fleischman and Heppen concluded that no one model can turn around low-performing high schools. They point out critical and "required" elements within the models that need to be implemented with fidelity, over enough time, with sufficient resources and with the full commitment of the school and the larger community (Fleischman & Heppen, 2009). Drawing on research by the nonprofit education and social policy research organization, MDRC, they identified "mediators of improvement" that need to be included in effective high school reform (Quint, 2006).

The following are some key design elements high schools need to address in providing a high-quality education for adolescents:

Carnegie Corporation of New York's ten integrated design principles

An effective secondary school design incorporates 10 integrated principles to meet the demands of the Common Core. A high-performing secondary school:

- Integrates positive youth development to optimize student engagement & effort
  - **Caring, consistent student-adult relationships** that communicate high expectations for student learning and behavior
  - **Clear expectations** for student competencies and standards of performance
  - Opportunities for students to **contribute** to the school environment and have a **voice** in decisions
  - Encouragement of **student responsibility** for meeting learning and personal goals
  - Openness to and encouragement of **family participation**
  - Integration of **community participation,** assets, and culture
- Prioritizes mastery of rigorous standards aligned to college & career readiness
  - Curriculum that **enables all students** to meet rigorous standards
  - Multiple **opportunities for students** to show mastery through performance-based assessments
  - Student advancement based on **demonstration of mastery** of knowledge and skills
- Continuously improves its operations & model
  - Use of **performance data and analytics** to improve curriculum and instruction
  - Regular review and revision of **school operations** and **model** to increase effectiveness
- Develops & deploys collective strengths
  - **Teacher teaming** that strengthens instructional design and delivery and enables professional growth
  - Mechanisms that promote **innovation and initiative** among teachers and staff
  - **Differentiated roles for adults** (e.g., multiple "teacher" roles) that enable effective implementation of the school model
- Manages school operations efficiently & effectively
  - **Purposeful use of time, people, and technology** to optimize teachers' ability to support student learning
  - All elements of school design organized to maximize **efficient use of resources**
  - **Flexible, customizable** scheduling
  - Clear **operational performance goals** and accountability mechanisms
  - Automation of basic tasks whenever possible
- Maintains an effective human capital strategy aligned with school model & priorities
  - **Consistent, high-quality systems** for sourcing and selecting teachers and staff
  - **Individualized professional development** that cultivates teachers' strengths and meets school needs and priorities, including use of blended learning
  - **Fair and equitable** teacher evaluation
  - **Leadership development opportunities** and a leadership pipeline
- Empowers & supports students through key transitions into & beyond high school
  - Explicit linkages between **future academic and career pathways** and current learning and activities
  - **Transparency** regarding student status and progress toward graduation for students and parents/guardians
- Remains porous & connected
  - Effective **partnerships** with organizations that enrich student learning and increase **access to community resources** and supports
  - Participation in a network of schools that **share knowledge** and assets
- Has a clear mission & coherent culture
  - Clearly defined **purpose, goals, and school culture**
  - Mission and culture embodied in all aspects of school design
- Personalizes student learning to meet student needs
  - Instruction in a **variety of learning modalities,** linked to students' strengths and learning goals
  - **Data-driven, real-time feedback** for students and teachers
  - Embedded, performance-based **formative assessments**
  - Effective use of technology for **anytime, anywhere learning**

Source: Carnegie Corporation of New York

- ***Curriculum and graduation requirements***

The number and types of courses in which high school students enroll and complete varies within and across states and schools depending on requirements, school offerings, teacher recommendations, parental influences, and student choice. Daun-Barrett and St. John concisely summarize how course completion and curriculum requirement policies relate to student success in high school, based on quality research that supports the following points:

- High school requirements influence course-taking patterns
- Course taking affects test scores
- Course-taking patterns and achievement affect high school graduation rates
- Policies affecting math course-taking patterns also affect the rate at which high school graduates continue on to college (Daun-Barrett & St. John, 2012).

Over the last century, educators and the public have debated the purpose of high school and thus shaped different ways of organizing courses offered and required. One way of categorizing types of high school curricula is as:

- Differentiated curriculum—organized into vocational, general, and academic tracks
- Comprehensive curriculum—choice-driven sets of courses aligned vertically (varied in difficulty such as regular, honors, Advanced Placement (AP) versions of history), and horizontally (organized as prerequisites for one year to the next)
- Constrained academic curriculum—a rigorous, narrow academic program followed by all students at the school (specifying how many courses in each subject and at what level of rigor within subjects) (Lee & Ready, 2009).

- **Grouping students by ability**

Intense arguments have been waged over how to shape curriculum placement policies by tracking or not tracking or grouping students by ability. Discussions center on how to maximize learning for all students either by grouping low-achieving students together and higher-achieving students together or by heterogeneous mixing of students of various abilities together. In tracking, the higher-achieving students would take more rigorous college prep courses than the other students, who would be in different courses within the school or in different schools altogether.

Numerous studies have found that tracking seldom creates homogeneous groups based on skill and prior achievement. Placement is often influenced by parental choices for courses, schools, and geographic residence and by teacher choices of how to track students based on other characteristics of the students. Empirical studies of tracking cannot measure these influences and thus bias the estimated impacts of tracking. In a strong recent study that attempts to correct for some of this bias, Hanushek and Wofmann (2006) look at tracking at the international level and find that early tracking of students increases educational inequality among students and may reduce the mean performance of the overall student group.

An earlier analysis by J. Oakes found that tracking tends to have an adverse effect on higher achievement for all students. Low income and minority students are disproportionately placed in low-ability groups and underrepresented in high-ability groups. Continuous tracking of these students over time can lead to low self-esteem and feelings of inadequacy. Not only do students

placed in low-ability tracks have less access to high quality content, they are not expected to master the same skills and abilities as those students in high-ability tracks.
Access to content is not the only result of tracking, though, as students in high-track classes report feeling that their teachers truly care about them whereas students in low-track classes report seeing their teachers as more punitive. These attitudes towards teachers translate to fellow students resulting in a more positive classroom environment for high-track students and subsequently a more negative classroom environment for low-track students (Oakes, 1986).

- **Use of time**

Many schools are exploring "extended day" schedules or "extended year" calendars with the hope that more time will improve student achievement. In their review of research conducted from 1985 through 2009, Patall et al. (2010) found limited evidence, but suggested that extended time at worst had no effect and may have a small relationship to improved student achievement. However, studies show much variability in its effect across different grade levels and subjects with no consistent patterns emerging. Studies suggest that extended schooltime is especially helpful for students most at risk of failing.

One of the most clear-cut findings on schools' use of time is that important distinctions matter when schools use the idea of extended time (schooltime, class time, instructional time, learning time) to try to improve student achievement. The research indicates that it is the time students are engaged in learning that matters to their success (Silva, 2007).

- ***Structuring schools for personalized and orderly learning environments***

The affective relationship between teachers and students matters for student success. In a meta-evaluation of numerous research studies, researchers found that positive relationships between students and teachers in high schools fostered significantly better student engagement in their education (Roorda et al., 2011). Another research synthesis of effective school practices cites numerous research studies supporting the argument that when teachers interact with students in positive, caring ways, students are more successful. Whether it is accomplished through smaller schools or "advisory" periods where teachers and students have time to communicate more personally, or other ways of school organization, there are advantages to teachers paying attention to students and their problems and encouraging their interests and accomplishments in and out of the classroom (Cotton, 1995).

In an attempt to provide a more supportive personal experience for high school students, many smaller schools have been created. Smaller learning communities within high schools or stand-alone small schools are ways to structure the schools, though they may also include different ways of organizing instruction or governance. In 2000, the U.S. Department of Education first funded high schools with over 1,000 students to develop smaller learning communities. These included freshman academies, career academies, and other schools within schools. Some research finds that smaller learning communities are succeeding in offering students stronger personalized environments and better ninth- and tenth-grade outcomes than similar large high schools. However, student and teacher self-selection make it difficult to see whether small schools help student achievement, graduation rates, or postsecondary success. Factors such as how instruction is shaped make size alone at best a useful but not sufficient factor for student success (Fleischman & Heppen, 2009).

A related but different emerging K–12 trend is the use of "personalized learning environments." Requested explicitly in the 2012 U.S. Department of Education Race to the Top call for proposals, personalized learning environments involve educators using data and specific technological tools—such as mobile devices or online resources—to customize instruction to each student's needs. A growing number of schools are using these strategies, but research on the impact on student learning is not yet available, and there is a wide variety of implementation around this issue (Ash, 2013); (McNeil, 2013).

- **Provisions for at-risk students**

Effective high schools need to provide all students with the support they need to succeed, irrespective of their skills upon entering ninth grade. In a 2010 national U.S. Department of Education survey, districts reported on various supports that high schools used to help at-risk students. Districts use different factors to identify students at risk of dropping out, but typically they use the following indicators: academic failure, truancy or excessive absences, and behaviors that warrant suspension or expulsion. In 84 percent of the districts, middle schools shared information with high schools about their incoming students with unique needs (Carver & Lewis, 2011).

"Alternative education" is a phrase often used generally to encompass everything from private to charter to homeschooling. However, currently the term most often refers to separate schools or classes within a school building that are designed for youth for whom school has not worked well. Research has found that well-designed alternative education can benefit some students at risk of failure. However, because alternative education has many meanings and is provided in a variety of settings, addressing various populations and using a wide range of strategies, there is not sufficient research to show its effectiveness.

- **Preparing students for postsecondary education**

High schools use resources and organize in a variety of ways to prepare students for college or other postsecondary education, workplace success, and adult life. They also use other specific strategies aimed specifically at supporting the transition from high school student to adult.

Chicago researchers have documented the serious gap between how many students aspire to attend college and how many actually enroll in college. While more than 80 percent of tenth-grade students nationally and across all ethnic and income groups hope to earn a bachelor's degree or higher, many fewer enroll in college. National figures from the early 2000s find that while close to 80 percent of high-income students graduating from high school immediately enroll in college, the proportions drop significantly to 63 percent of middle income, 52 percent of low income, 58 percent of African American, and 57 percent of Latino students immediately enrolling in 2004 (Roderick, Nagaoka, & Coca, 2009).

In a critical review of research and evaluation of college access interventions and practices, a panel of experts makes five recommendations for what every high school should provide for its students to be prepared to enter college:

- Offer courses and curricula that prepare students for college-level work and ensure that students understand by ninth grade what constitutes a college-ready curriculum.

- Utilize assessment throughout high school so that students are aware of how prepared they are for college, and assist them in overcoming deficiencies as they are identified.
- Surround students with adults and peers who build and support their college-going aspirations.
- Engage students and assist them to complete critical steps for college entry.
- Increase families' financial awareness, and help students apply for financial aid (NCEERA, 2009).

Other researchers echo this call for both academic and practical improvements in high schools. Students will have stronger access to college if their high schools foster in them: content knowledge and basic skills, core academic skills, noncognitive and behavioral skills, and knowledge about how to search for and apply to college (Roderick et al., 2009).

Dual enrollment and early college high school programs allow students to take college courses and earn college credits while in high school. Many of these programs are on college campuses and some are in high schools. While the research suggests that students in these programs may find supportive personalized learning communities and other benefits, there is not yet definitive data to suggest that these schools are any better at supporting students in school. (Fleischman & Heppen, 2009).

➢ **Preparing students for careers or other training**

The "real-world" involves more than college enrollment, and some schools are explicitly committed to a career or curricular theme. Evidence exists that between 1985 and 2000, career academies helped students perform better in high school and drop out less than students in comparable non-career academies, but students did not necessarily have higher achievement scores or better postsecondary success (Kemple, 2008). However, the evidence is not clear on other types or more recent iterations of specialty or career academies, such as science, technology, engineering, and mathematics (STEM) high schools (Fleischman & Heppen, 2009).

In one study that included interviews with a national sample of over 450 high school dropouts age 16 to 25, researchers found that over 80 percent believed that if schools provided opportunities for real-world learning (internships, service learning projects, and other opportunities), it would have improved their chances of graduating from high school (Bridgeland, Dilulio, & Morison, 2006). There are a number of new high school "models" that support students in more personalized planning for careers and for early experiences outside of school. For example, the *Generations Schools Model* includes not only rigorous and academic courses and more personal attention to each student but also "intensive courses" in which students focus for one month at a time on one career or workplace by doing research, writing, working on projects, taking field trips and even interning at job sites. These innovative models show promise, but there is not sufficient data to demonstrate their advantages over other models. However, evaluations to date offer insights as to the challenges of implementing the new models (Generation Schools Network, 2014).

Specific studies on college preparatory, career, and technical education curriculum

Lee and Ready (2009) describe curricular policies within the United States over the last three decades. They note their own earlier research comparing constrained academic curriculum in Catholic schools to public schools. In that work, they found promise in requiring more constrained academic curriculum for all students. However they also note recent research at the Consortium on Chicago School Research that examined CPS's constrained academic curriculum or "College Prep for All" policies implemented in 1997 (Allensworth et al., 2009). On a school district level, the Consortium studies found that College Prep for All correlated with some improvements in ninth-grade course-taking but declines in high school completion. It appears to have had no effect on college enrollment (Allensworth et al., 2009).

Given these findings, Lee and Ready conclude that while much prior research supports the idea that all students should be required to take a college prep curriculum, these prior studies did not correct adequately for selection bias. For example, different students within schools may select courses of varying rigor, and the rigor of courses offered may also vary from school to school. Further, students who select—or whose parents or teachers select for them— the most rigorous courses are more likely to come from socioeconomically advantaged backgrounds. They also note that the Chicago findings show that along with curriculum requirement policies, other issues in high school need to be concurrently addressed—for example, student motivation, the quality of instructional practices, and teachers' ability to differentiate instruction across students with varying abilities and needs (Lee & Ready, 2009).

Following up on this work, Daun-Barrett and St. John (2012) look at how implementing a state requirement for a constrained academic curriculum in high schools may prevent some students from completing high school but may positively influence the proportion of students who continue on to college once they graduate. Specifically, requiring higher levels of math courses of Algebra, Geometry, and Algebra II was correlated positively with higher college continuation but not test scores or graduation (Daun-Barrett & St. John, 2012) rates. Another study by Plank and colleagues (2008) used National Longitudinal Survey of Youth 1997 data and suggest that a middle-range mix of exposure to both career and technical education and academic courses can strengthen a student's attachment to school and motivation to stay in school.

Nationally, the number of students who take college preparatory courses versus more occupation-oriented curriculum in high school varies. In a study of a representative national sample of students in the high school graduating class of 2003–04, 26 percent followed an academic curriculum concentration, 15 percent an occupational curriculum concentration, 3 percent both academic and occupational, and 56 percent a general curriculum. The academic curriculum defined was a constrained academic curriculum that included four years of English, three years each of math (including some higher than Algebra II), science (including some higher than General Biology), social science (including U.S. or World History), and two years of a single foreign language (Planty et al., 2006). The survey findings showed that:

- 30 percent of students received credit for advanced placement or international baccalaureate courses;
- Most students took math through Algebra II (46 percent) or through Trigonometry (36 percent), 14 percent took Calculus in high school; and
- Most students took science through General Biology (25 percent) or at least Chemistry I or Physics I (33 percent), and 36 percent took Chemistry I and Physics I and additional higher-level science.

However, these numbers were highly skewed when looking at students within ethnic groups. For example, 53 percent of Asians, 33 percent of whites, 25 percent of Hispanics, and 16 percent of blacks earned credit in AP or IB courses (Planty et al., 2006).

III. What Do We Know About How to Improve School Systems?

Critical reviews and studies of various high school reform efforts have not identified a specific strategy or model with sustained systemic success (Fleischman & Heppen, 2009). However, a body of research has developed on the reform of large school systems and on central city public schools. The studies examine implementation, leadership, organizational change, and social movements. They contribute useful, rich, descriptive stories and themes on how reforms start, make progress, change or fold under the weight of the forces against them. Research shows that school reform requires:

- Long-term, inquiry-based teacher professional development
- Informed administrators and teachers
- Allied teacher union leaders, and
- Time for capacity building to achieve change incrementally.

A comparative case study of a dozen neighborhood Chicago Public Schools between 1997 and 2001 found that those developing positively in terms of "essential supports" and student achievement had the following common reform strategies:

- Targeted multiple essential supports in a concerted or coordinated manner,
- Multiple complementary change strategies,
- Strong aligned base of external resources, and
- Strong distributed leadership (Smylie & Wenzel, 2003).

McDermott (2000) called attention to the barriers for large-scale urban reform where systemic change is not in most school officials' interest given that there are political pressures for making quick improvement. She suggests that the more likely outcome of urban reform is partial implementation of many programs rather than full systemic reform.

Some researchers point out a more holistic approach based on the idea that by strengthening the community around the school, one strengthens the student and vice versa. Students are not only a reflection of their community, but also a link to the larger community of parents, business, and civic leaders. With students serving as a bridge, schools can reach out to parents and other community members who may need assistance with health problems, literacy and language fluency, legal and financial resources, or preservation of culture (Warren, 2005); (Eccles & Gootman, 2002). Also, engaging the community can ensure that reform efforts are culturally sensitive and specific to the ethnic, religious, or other sociocultural needs of community members (Warren, 2005); (Eccles & Gootman, 2002).

Within the education environment, community members can be empowered as agents of change both in their investment in students' learning and in the general improvement of their communities. However, with community revitalization, there can be a struggle of power versus empowerment, including sensitive issues of culture and the dynamics of power both within the classroom, such as how students should learn, and how change should occur (Fine, 1993); (Delpit, 1988).

A. System reform is the new unit of change

Systemic reform of education recognizes the educational system as the unit of change and emphasizes that the key to successful improvement is built around alignment and coherence between system components. Conclusive evaluations of the success of this type of reform are elusive, due to the challenges of measuring concepts like "alignment" and identifying appropriate comparison groups at this large system scale (Supovitz & Taylor, 2005). One cannot succeed in efforts to attempt, achieve, and maintain equity-focused education reform without attending to the systemic and political forces that impact schools.

Yet there are many who have studied these systemic efforts and distilled the complex process, highlighting critical issues that need to be addressed. Fullan (2011) observes that in effective system change, successful reform involves and supports intrinsic motivation of key players in the process. He presents an empirical argument that accountability, the focus on individual talent and work, technology, and fragmented strategies are ineffective as lead drivers of education reform. The drivers used that effectively improve systems are capacity building, collective team work, the focus on instruction, and coherent systemic strategies. (Fullan, 2011).

A study of nations where school systems moved from poor to fair found that their reform efforts focused equally on accountability and professional learning. Those that went from great to excellent focused 78 percent of their efforts on promoting professional learning and 22 percent on accountability (Mourshed et al., 2010); (Fullan & Knight, 2011).

A study of Finland's highly productive and equitable school system highlights core principles for successful reform that include clear and public attention to recognizing the value of its teachers and trusting their professional judgment in schools. In that vein, the Finnish system does not employ external standardized student testing or rigorous inspection of schools and teachers. Rather it works to recruit the best teachers, prepare them well and support their autonomy and responsibility for curriculum and student assessment (Sahlberg, 2011).

Lessons learned from systems that are improving

What would education policies and practices of the United States be if they were based on the policies and practices of the nations, provinces, and systems that now lead the world in student performance? A study completed in 2011 investigating the strategies used by educational systems that had improved listed the seven strategies used by the top-performing systems. These include:

- Aggressive international benchmarking
- Powerful, coherent, aligned instructional systems
- Design to get all students to high standards
- Funding systems that put more behind students who are harder to educate
- High-quality teaching force
- Workplace organized and managed along professional, not industrial, lines
- Coherent education strategies throughout the system (Tucker, 2011).

B. Achieving equitable access for all to quality learning opportunities is the key challenge

One of the main lessons learned from the international systems is that of the positive correlation between social equity and high-performing education systems (Sahlberg, 2013). In systems where there are deep social and economic inequities, poverty predicts education failure. In the absence of equal economic opportunity, the challenge of public education is thus to provide supplemental supports according to need in the highest-needs schools and communities to increase:

- Access to high-quality instruction, coursework, and programs
- Opportunities in and outside of school to expand learning

Using various measures of student engagement in school, it is clear that race and income, language ability, and disability distinguish between students who spend time in school and graduate and those who, for various reasons, miss instructional time, drop out of school, and do not graduate from U.S. high schools. In addition, there are discrepancies in how equitable high school learning outcomes are even for those who do persist.

In the United States and many other countries, schools with more students from low socioeconomic backgrounds have fewer teachers per student than more advantaged schools (OECD, 2011). Public schools in urban U.S. cities have higher poverty rates on average than suburban public schools and also have greater challenges staffing schools with effective teachers—more often relying on short- or long-term substitutes or less than fully qualified teachers (Jacobs, 2009). Nationally, public schools serving the most African American and Hispanic students are about twice as likely to employ teachers in their first or second year of teaching compared to schools serving the fewest. Furthermore, teachers in these predominately African American and Hispanic schools are paid less.

In the Chicago Public Schools (CPS), 16 to 17 percent of teachers are in their first or second year in both highest and lowest minority-serving schools. In its high schools, CPS pays average teacher salaries that are more than $5,000 less in schools serving the highest fifth of African American and Hispanic students compared to the salaries in schools serving fewest minorities. (Office for Civil Rights, 2012).

Large groups of students disproportionately miss out on enriching courses that can prepare them for success. Schools are more likely to offer specialized Advanced Placement (AP) courses when they have more white students, high-income students, and high-achieving students (Iatarola et al., 2011). While nationally over 80 percent of high schools offer Algebra I, Geometry, and Biology, only about 50 percent offer Calculus. On average, high schools with large African American and Hispanic enrollments are less likely to offer Algebra II, Physics, or Calculus. In the Chicago Public Schools, 82 percent of those high schools with the fifth-highest proportion Latino/African American enrollments offer Algebra II compared to 85 percent of the high schools in the lowest quintile for Latino/African American enrollments (Office for Civil Rights, 2012).

C. Implementation at scale involves more than scaling up

Recent studies on implementation of educational innovations recognize that programs inevitably change from design phase to rollout to scale up stages. Given the differences between school settings as well as the autonomy and professional nature of teaching, bringing common practices into multiple sites

requires thoughtful engagement and collaboration among actors. Major challenges occur when attempting to move a whole district or state improvement (Elmore & McLaughlin, 1988); (Fullan & Steigelbauer, 1991).

Few conceptual models and strategies have been developed for scaling up or disseminating successful reforms (Adelman & Taylor, 1997; Elmore, 1996) and there is no evidence on the effectiveness of methods of scaling up. Studies of attempts to scale-up innovations do yield many lessons of what types of difficulties derail success. In a study of state-level efforts, Fuhrmann (1994) identified the following issues that must be confronted to implement large-scale reform:

- Overwhelming workload with limited resources
- Difficulty in articulating the nature of reforms so that the public and educators understand that reforms go beyond standards and assessment
- Moving the goal of equity for all students to the forefront of rhetoric and devoting resources to address it
- Understanding that problems other than instructional reform—such as crime, desegregation, and school finances—sometimes overshadow efforts
- The grip of the past with old policies on the books and business as usual
- Turnover in leadership that can derail reform efforts

D. Civic and grassroots engagement is the lynchpin of system-wide improvement of education for all

Oakes and Lipton (2002) conducted an intensive case study of high schools. They offer robust evidence of how school reform requires

- long-term, inquiry-based teacher professional development;
- informed administrators and teachers;
- allied teacher union leaders; and
- slow incremental changes as capacity develops.

Over and above these needs, when redistribution of resources are attempted for equitable education, it is also important to deal with conflict and apply lessons from grassroots social movements (Oakes & Lipton, 2002).

Research indicates that urban school reform requires long-term strategic building of civic relationships and attention to social stratification as a source of social and economic inequalities (Shipps, 2003); (Stone, 2005). Stone's research and his review of others' work make a compelling empirical case that to be effective, partners engaged in school reform coalitions need to be skilled in their social interactions, able to make the effort and take action and have access to the resources needed for the policy agenda sought (Stone, 1989); (Stone, 2005); (Stone & Worgs, 2004); Stoker, 1995). It is not just the elites who need to be engaged but also those people who have faced the social and economic inequities in play within the community. Further, attention needs to be paid to both small selective incentives for those involved but also the larger grand and inspiring vision for the long-term (Stone, 2005).

Review of individual school-based strategies for school reform reveals the challenges

There are complex reasons for low-performing high schools, which face many challenges to improvement. In fact, some reformers contend that the best way to improve their students' chances to succeed is to drastically change the structure and staffing of individual schools. The research is not clear as to whether these "reconstituted" or "turnaround" schools may yield stronger outcomes than other schools, or how they will achieve them. An early study looked at Chicago's efforts to turn schools around and found that the 14 Chicago high schools involved in these initiatives from 1997 to 2010 did not show improved student performance in terms of attendance or the percent of ninth-grade students finishing the year on track to graduate (De la Torre et al., 2012).

Charter schools and educational management organization models also suggest that altering school governance will lead to the instructional and structural changes high schools need to improve. Autonomy and flexibility in governance and market competition are believed to make these schools effective. But since charter schools and education management organizations come in many forms, a necessary question is what features of the school matter in terms of promoting student success. Many of these schools are small learning communities. A recent small study found support for charters that focus on higher education, provide a safe and orderly environment, and a positive culture (USDE Office of Innovation and Improvement, 2006). There is a lack of clear evidence on the effectiveness of both charters and education management organizations compared to other schools (Fleischman & Heppen, 2009).

Another strategy is "innovation zones," in which states or districts place certain public schools together in an autonomous in-district zone and then grant them greater policy flexibility compared to the wider district. These zones were introduced in the 1990s and have focused on a wide variety of innovations, such as staffing policies or technology integration. Studies of these zones have found mixed performances, including some successes. Sustained and long-term successes have been harder to find (Ash, 2013).

Conclusion

The research summarized here is not a simple blueprint for how to build a better school system consisting of high-quality schools. Instead, it serves as a living document from which to begin a comprehensive, coordinated, and coherent approach to revitalize neighborhood public high schools, emphasizing equity and access to high-quality education for all students.

Research reveals that much is known about what students need and what quality schools look like. It also confirms that there are models that have yet to be created: schools throughout an entire city that provide without fail the highest quality learning opportunities to all students, coupled with opportunities for learning outside of school with the support of coordinated community resources, and the engagement of the wider civic community. The effort to achieve such a model requires political will, a collective vision that embraces the value of all our young people, and planning for long-term sustainable improvement of secondary education that is unprecedented in any urban community in the United States.

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