THE CHALLENGE OF HIGH SCHOOL REFORM

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DIRECTOR AND MODERATOR:
Dick Clark

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Carol Copple, Ph.D.
Rapporteur

The Challenge of High School Reform was the theme of the 2006 conference sponsored by The Aspen Institute Congressional Program, held February 21-26 in Montego Bay, Jamaica. The meeting was the thirteenth in a series that examines policy options for promoting the education and well-being of American youth, and thus the well-being of the nation. A bipartisan group of 12 Members of Congress participated, together with eight invited experts with relevant knowledge and experience. The Congressional Program series is not intended to yield a consensus statement of recommended policy directions. Rather, the aim is to help inform policymakers and facilitate the search for common ground on which effective American legislative policy must rest. The 2006 Congressional Program conference examined a range of issues and policy options with respect to meeting the challenges of education reform.

High schools in distress

In this era of standards-based reform and holding schools accountable for teaching all students, promising gains are beginning to emerge in many elementary and middle schools around the nation. Yet in American high schools student achievement is static, and concerns are escalating. Recent reports reveal that around 30 percent of high school freshmen never reach graduation, and in some urban districts more than half drop out before the senior year.

For many students who remain in school, the picture is troubling as well. Only 36 percent of seniors perform at the "proficient" level in reading and only 17 percent in mathematics, according to the National Assessment of Educational Progress. In large urban and high poverty areas performance is lower still. Even those students who make it to college too often are inadequately prepared to succeed. At present, a quarter of the students entering four-year colleges and nearly half enrolling in two-year colleges never return for a second year, and more than half of college freshmen are now taking remedial courses.

High schools for a new era

These dire statistics seem to point to a dramatic worsening of high schools in recent decades, but a larger force is behind the data. A sea change has taken place in what U.S. high schools are expected to accomplish. Today Americans find themselves in an economy characterized by global competition and unprecedented technological change, but still with high schools that are geared to the economy of the past. High schools have been based on a model that assumed only a minority of most students would pursue postsecondary education or training and thus need rigorous academic preparation. This assumption does not match the present reality: a knowledge-based economy that requires a highly skilled, educated, flexible workforce. Students now need to graduate with
preparation for college-level work; they will either go to college or need comparable skills to succeed in other postsecondary training and in the workforce. Thus, significant improvement of outcomes for high school students is a necessity for their future and for the nation’s future as well.

A solid foundation for high school success

Although standards-based reform and No Child Left Behind accountability have galvanized change and brought achievement gains in many school systems, this progress is often overestimated. While all state testing programs are able to point to significant achievement gains, there is enormous variation in the rigor of the various states’ assessments and how they define proficiency and set cut-scores. The common metric provided by the National Assessment of Educational Progress (NAEP) reveals wide state-to-state differences and alarmingly high proportions of students performing below the proficient level in reading and other key areas. Elementary and middle school education may be moving in the right direction, but many schools have a long way to go in enabling all students to achieve proficiency in grades K-8.

In elementary and middle school, students need to get a firm foundation that includes the literacy skills needed for high school course work. Despite increased attention and funding in the elementary grades, a documented slump in reading development still occurs around fourth grade. It is at this grade level that instruction traditionally begins to focus on the content instead of on helping students to read the content. “Reading to learn” replaces learning to read. Many students, particularly in urban and rural low-income neighborhoods, unfortunately lack the proficiency, vocabulary, and background knowledge to make this transition successfully.

Those who enter high school with low reading proficiency are unlikely to succeed unless the school uses intensive, focused strategies to give them the necessary skills. To this end, all freshmen should be assessed at or before entry and prompt, intensive measures implemented to get them on track. Making up lost ground at the high school level is very difficult but can be done if schools keep a laser-like focus on this goal. For example, significant learning gains can be achieved by teaching off-track students in classes of 15 or fewer students that meet for at least one hour per day and are led by a highly skilled teacher. In these classes instruction focuses on word recognition, fluency, vocabulary, and strategies for encouraging persistence. As students master the basic skills of reading, the instructional focus needs to shift to comprehension strategies with continued emphasis on vocabulary building. Strategies such as alternative scheduling, summer school, and after-school programs can be brought to bear to get students to where they need to be in literacy and other core subjects.

Aspiration and achievement in high school—a troubling gap

Data confirm the common sense prediction that students with stronger achievement test scores at entry will fare better in high school. Yet even students who demonstrate grade-level performance when entering ninth grade often fail in the high school years. As the nation experiences a dramatic increase in the achievement level that all students need to attain, many U.S. high schools are not coming close to meeting this challenge.

This situation is particularly disturbing because today’s students and their parents are well aware of the importance of graduating from high school and going on to college. Aspirations have risen markedly across all economic and ethnic groups, with the largest increase among students from low-income families. Most students now enter high school with the hope of graduating and going to college, yet far too many never even make it to graduation. In the Chicago urban schools, for example, 87% are aiming for college yet only 54% graduate from high school. The results are not only poor employment prospects for the non-college bound, but also a substantial loss for the American economy from each group of 18-year-olds who do not graduate. A critical juncture for tackling this problem, research indicates, is the ninth grade year.

The costly failure of ninth grade

The beginning of high school is a precarious time for students. Many freshmen enter a school that is far larger, more complex, and more anonymous than the one from which they came. They daily encounter a host of teachers and peers, and they experience an onslaught of new academic demands with fewer supports than they have had before. In many urban high schools, particularly those in high-poverty neighborhoods, myriad scheduling problems and shifts in teacher assignments over the early weeks of school add to the chaos. Even among high schools that handle incoming students more smoothly, few are organized to provide them with supports and focused attention during the transition to ninth grade.

Evidence shows that a successful transition to high school greatly increases students’ likelihood of graduating. Conversely, a rough start is often the beginning of a downward spiral that culminates in failure to graduate. Overwhelmed from the outset, many students begin to fail courses, get behind, and experience cumulative failure and discouragement. A student who fails a course, especially a graduation requirement, is immediately placed in a catch-up position. Although failing a course suggests the student is struggling with the material, he or she typically moves on to the next semester having received no remediation and thus is at high risk of failing again. At most schools, the failing of courses in the freshman year remains a red flag that goes unheeded.

Supporting student learning

Innovative educators are considering a number of programs and practices designed to improve the ninth-grade experience and the high school as a whole. A major theme of these innovations is creating some kind of smaller unit or school-within-a-school for ninth-graders. Particularly promising is the model of the freshman academy, a self-contained school-within-a-school where ninth graders share the same teachers in an interdisciplinary team. Students might take double course offerings in English and mathematics as well as participate in courses designed to give them transitional skills that they need to move to high school level work.

Providing effective recovery or remediation programs is equally critical. Among the strategies schools are trying are summer school, after-school tutoring, alternative sequences of courses, and advising and support programs to help students get back on track.

The teachers we need

Nothing is more important to students’ success at any level of schooling than good teachers. At present the U.S. faces the simultaneous challenges of the baby boom generation reaching retirement age, NCLB requiring higher standards for teacher qualifications, and states having put in place more ambitious course requirements. As a result, the nation faces a formidable task in developing a teaching force of sufficient quantity and quality. Clearly needed are strategies for recruiting promising teachers both at the postsecondary level and at mid-career. Within colleges, improving the status and stature of teaching is important for recruitment of a high-quality teaching force. One reform thrust is encouraging colleges to assume greater responsibility for improving mathematics and science teacher education through the establishment of a comprehensive, integrated system of recruiting, training, and advising mathematics and science teachers. Raising the amount of Pell grants and loan forgiveness are also key strategies to consider. In light of high tuition levels and the debts with which many young people would have to begin their careers, tuition credits and forgone loans can significantly increase the feasi-
ility of entering the teaching profession.

Purposefully recruiting mid-career professionals into math and science teaching is also important. Such recruits are likely to benefit from a customized induction experience that capitalizes on their maturity and life experience. Congress can lend further support to groups like the New Teacher Project that strive to recruit mid-career professionals into teaching and develop appropriate induction supports for them.

Teacher recruitment and retention are critical issues, but problems of student achievement will not be fixed simply by recruiting and retaining a better teaching force. Improving teachers’ knowledge and skill through changes in both preservice and inservice teacher development is essential.

Effective professional development and teacher preparation

What do high school teachers require to be effective in the classroom? Certainly they need to have a deep understanding of the subject matter. But content knowledge alone is not enough. Today’s teachers need not only a solid grasp of content and familiarity with general aspects of pedagogy; they also need to have “pedagogical content knowledge” within a specific discipline. That is, teachers must have an understanding that is blended of content and pedagogy and enables them to organize particular topics, problems, and issues in the specific discipline and adapt these to learners’ diverse interests and abilities. To gain such knowledge and skill in college courses or inservice professional development requires having opportunities to engage with the discipline and link it to new ways of thinking about one’s instruction—ways that combine factual knowledge with pedagogical techniques and that develop pedagogical content knowledge.

Although districts generally devote significant resources to professional development, it is often fragmented and not well connected to strategic goals for improving teaching and learning. Teachers receive scattershot training sessions and get credit for isolated courses with little bearing on their daily work. However, research suggests that what affects student achievement are teachers’ opportunities to participate in sustained professional development grounded in content-specific pedagogy linked to the curriculum they are learning to teach. Effective professional development is coordinat-
ed, focused on students’ major learning needs, and linked directly to the accountability system. To achieve high-quality instruction, teachers need sustained professional development that is closely connected to practice, both in their pre-service preparation and on the job, and such professional development is far from typical.

Teachers also need regular opportunities to analyze and reflect on their practice, which includes assessing student learning and examining results to guide instruction. For teachers to engage in such reflection and analysis requires actions to reshape the school environments in which teachers work. Evidence from other countries, as well as results in U.S. schools, suggest that even teachers are able to work together to design and deliver instruction, school improvement occurs.

Federal support for development of better measures of teacher knowledge and skill is one option for encouraging improved teacher professional development. Teacher effectiveness Support could be directed to states or groups of states, or to districts. For instance, the Urban Mathematics Leadership Network is a consortium of 14 large urban districts seeking to develop common tools and strategies for strengthening high school mathematics teaching and learning. Achieve is a bipartisan, non-profit organization that helps states raise academic standards, improve assessments, and strengthen accountability. With additional resources, these and similar groups could increase their efforts, as could the National Board for Professional Teaching Standards (NBPTS). With federal and foundation support, NBPTS has created well-regarded methods for judging the performance of experienced teachers. Its National Board Certification is a voluntary, advanced teaching credential recognized by local, state, and national policymakers as a mark of excellence in teaching. The rigorous assessment process for certification includes a classroom-based portfolio and a set of performance assessment exercises. Since the inception of Board Certification, over 32,000 individuals nationwide have achieved certification as accomplished teachers. Results suggest that continuing, and perhaps expanding, federal funding to NBPTS may be a practical way to leverage education outcomes. Board certified teachers have been shown to produce greater student achievement gains than their counterparts, especially for lower achieving students. In addition, as accomplished teachers further improve their skills through the certification process and achieve recognition for doing so, their value goes up as models of excellent teaching within their respective schools and districts.

Much of the action in teacher quality improvement naturally takes place in the states. As early as the mid-1980s some states, most notably North Carolina and Connecticut began to make substantial and systemic investments in teaching. Actions have included major statewide increases in teacher salaries, incentives for teachers achieving National Board Certification, intensive recruitment efforts, and incentives to improve teacher education, licensing, beginning teacher mentoring, and ongoing professional development. Encouragingly, the states that have taken significant steps have shown considerable student achievement gains. Providing incentives for states to make such investments may be a viable federal policy option.

Supporting improvement of school leadership is another potential point of impact for federal action. Every high school needs an effective principal to head the administrative team and provide ongoing leadership to bring instructional coherence and the commitment to continuous improvement. However, principal recruitment is not sufficient to meet demand and turnover is high, especially in the schools that most urgently need effective leaders. To boost both effectiveness and retention of principals, a possible strategy is to support training to equip current and prospective principals for the complex job of running a school today. Administrators need training in budgeting, analyzing pertinent data, and other management skills.

Challenges in mathematics and science education

Demand is mounting for a scientifically and technically prepared workforce in the U.S. With private sector competition for mathematics and science majors, an increasingly severe shortage of math and science teachers exists around the country. In recent years districts have passed high school graduation requirements that include more advanced math and science courses, and they lack enough qualified teachers to staff the courses. Exacerbating the shortage is the push to reduce class size in high school math and science in some states and districts. Educators and policymakers recognize that the lack of qualified math and science teachers threatens to undermine reform efforts and, in turn, the economy.

In tackling this problem, compensation is certainly a key issue that policymakers recognize that they need to pay more in these hard-to-staff positions, but they have often faced union opposition to differential pay. Working with unions to find common ground and creative approaches will be important in making progress towards wider use of differential compensation and incentives to teachers in hard-to-fill positions and in hard-to-staff schools. Loan forgiveness in exchange for the individual’s commitment to teach for a period, such as five years, is an option that merits consideration.

Funding for high school improvement

The majority of federal and state policy initiatives and resources are currently directed to younger children. Federal funding for Title I in grades K-8 is more than five times what it is for
grades 7-12. The rationale for concentrating Title I funds in the elementary grades seems to be based largely on the "inoculation" assumption—that focusing support on the elementary grades will build a foundation for students to move successfully through the upper grades. However, early-grade gains have proven to fade away in the upper grades when students are in low-performing schools. Actions to achieve a better balance between grades K-5 and grades 7-12 in Title I funding are one federal lever that could be used to good effect. A similar disparity on a smaller scale is evident in federal spending on Reading First, which is directed to grades K-3, as compared to spending for Striving Readers, aimed at students in grades 6-12. Increasing investment in Striving Readers may be a reasonable step to helping more students get the reading skills they need to succeed in high school.

Finally, the vast disparity in resources for education across districts and states constitutes a serious barrier to improving low-performing schools. A possible strategy to consider is requiring states to put in place equitable, adequate education in order to receive federal funds. Federal leveraging of action and resources from state and local governments and other community sources multiplies the impact of federal dollars.

Aligning Dropout Prevention Approaches with Efforts to Raise Achievement and Improve High School Performance: Evidence from the Chicago Public Schools

Melissa Roderick, Ph.D.
School of Social Service Administration
The Consortium on Chicago School Research
The University of Chicago

SYNOPSIS: In large urban school systems like Chicago, over 40% of students who enter high school do not make it to graduation. This short paper draws on recent research in Chicago to argue that we can make substantial progress in reducing rates of school dropout by targeting efforts on the transition to high school and, in particular, in reducing high rates of course failure. I present a three-part strategy for taking on the dropout problem that focuses the bulk of efforts on improving student achievement and course performance, particularly around the critical transition to 9th grade. I also identify the types of students who may need special intervention and alternatives. These three core strategies are not only critical for reducing rates of school dropout but must be the foundation of any initiative to improve achievement in urban high schools.

Introduction

Across the country, policymakers at the national, state, and local levels have turned their attention to the problems of high schools. There is a consensus that high schools, particularly in urban areas, are broken institutions, plagued by high dropout rates, persistently low performance, and disengaged students who are seldom challenged and held to high standards. Of the myriad of problems facing high schools today, from a societal point of view, reducing drop out rates is arguably the most critical. Rising economic payoffs to skills and declines in the earnings of the non-college bound means that students who drop out of school struggle significantly and face poor life prospects. The economist Henry Levin estimates that America loses $192 billion in GDP with each group of 18-year-olds who do not complete high school. A Rand report on the minority achievement gap similarly concluded that equalizing high school drop out rates between Whites and Hispanics and Whites and African-Americans provides the highest cost-benefit ratio of any policy option to equalize educational attainment.

The negative consequences of dropping out are not new to today's students. Over the past several decades, the educational aspirations of youths have risen significantly. Nationally, the percentage of 10th graders who hope to complete a bachelor's degree or higher doubled, from 40% in 1980 to 80% in 2002. Increases in aspirations have been observed across racial and ethnic groups, with the largest increases occurring among students from low income families. At the Consortium on Chicago School Research, we regularly survey Chicago public high school students. In 2005, 75% of 9th graders stated that they hope to complete a bachelor's degree and
an additional 12% hope to obtain a two-year degree. 4 Fully 83% of freshmen stated their par- ents expect them to go to college.

Too often, students’ aspirations are not trans- lating into attainment. And the first step in clos- ing the aspirations-achievement gap in urban areas is addressing the dropout problem. In the Chicago Public Schools (CPS), only 54% of 13- year-olds make it to graduation by age 19. 5 The gender gap in graduation rates is astonishing. Only 86% of African-American male and 91% of Latino male 13-year-olds in the CPS graduate by age 19, compared to 57% of African- American females and 65% of Latino females.

These statistics are a clarion call for action. School administrators and policy makers, how- ever, often lack coherent strategies for attacking the problem and too often relegate dropout prevention to ancillary programs rather than making dropout prevention a core focus of high school reform. The advent of high stakes testing and accountability, moreover, has made educators increasingly reticent to address drop out rates, believing that such efforts are in con- flict with raising test scores; e.g. that if their drop out rates drop, their achievement test scores would too. For the first time in the history of the American high school, high schools are being judged by test scores and, as a consequence, drop out rates have become a problem in “managing the agenda” that administrators pursue their primary goal—high test scores.

What would it take to reduce dropout rates in urban high schools? I use Chicago as a case study to present a set of strategies for reducing dropout rates that focus the bulk of attention on improving the core instruction programs and organization of high schools, particularly around the critical transition to 9th grade. I draw on my and my colleagues’ work at the Consortium on Chicago School Research to demonstrate the extent to which low levels of high school readiness in terms of academic skills and high levels of course failure in the transition to high school, regardless of stu- dents’ prior levels of achievement, drive the drop out problem and provide a critical point of intervention for policy. I argue, moreover, that high rates of school drop out and low stu- dent achievement are not separate problems. They are reflections of the poor quality of instructional programs, high levels of disorga- nization, and a lack of coherent focus on stu- dents’ performance in their coursework within high schools, all of which causes us to lose too many students before graduation and to ulti- mately fail those survivors who make it.

What will it take to reduce dropout rates? The importance of building students’ capacity to do high school level work and the critical role of freshman year.

How is it that freshmen in Chicago enter high school with the hope of graduating and going to college, yet only 54% make it to grad- uation? I would argue that dropping out today is most often a process centered on academic failure, with students having the aspirations but not the skills or supports to manage high school. They begin to have difficulty, fall farther and farther behind, and eventually realize that they simply cannot make it to graduation. And, the bulk of this problem happens in the transi- tion as students begin to struggle with the academic, social, and developmental demands of their high school environments. Reducing drop out rates then begins by building students’ capacity to do high school level work, ensuring that they have the structures and academic sup- ports to transition successfully, and ensuring that they continue to pass classes and move through high school without falling behind.

This is a simple idea and one that is an important first step. There is a tendency among educators when talking about drop outs to immediately move to the extremes of the prob- lem, most of which have nothing to do with stu- dents’ experiences in school. Educators often focus on students who have dropped out because of home problems, child care responsi- bilities, or problems such as gang involvement. Addressing dropouts in this characterization does not mean changing existing practice or improving the core capacity of schools but adding on programs, alternatives, or special ser- vices. Thus, the belief that students drop out because of non-educational problems leads educators to perceive dropping out as a prob- lem they do not produce, cannot influence, and for which they are not accountable.

Such logic, that attention to dropout rates is outside of the traditional reach of high schools, while powerful, is largely unsubstantiated by the data. Getting beyond the rhetoric, data from Chicago and recent research on interventions during 9th grade demonstrate that significant progress in reducing rates of school drop out can be made through a focused approach each on: (1) improving achievement prior to high school and providing more transitional acade- mic supports; (2) ensuring that students are getting off to a good start through a combina- tion of a focused instructional program, reduc- tion in the academic and developmental demands placed on youth, and structured sup- port; and (3) developing systems of recovery, monitoring, and intervention so that students are kept on track.

Strategy 1: Increase students’ skills and provide tran- sitional supports so that students have the capacity to do high school level work

Anyone who has worked on high school reform has been faced with the argument that the prob- lem of high schools is really a problem of 4th grade or even earlier. Many high school educa- tors complain that the central problem they face is that their students are too far behind and not ready to do high school level work. If there is one important point to take away from this paper it is that this, in the end, is an insuf- ficient explanation for the high rates of acade- mic failure in urban high schools. At the same time, few would disagree that basic skills are a critical foundation for high school perfor- mance. And, evidence from Chicago demonstr- ates that making improvement in students’ basic skills should be a core component of any strategy to reduce dropout rates.

Since 1988, Chicago has been an epicenter for educational reform that began with decen- tralization reforms in the late 1980s and contin- ued with mayoral takeover of the school system in 1995. In this second wave, the new adminis- tration implemented strong accountability mea- sures for schools, ended social promotion in the 3rd, 6th, and 8th grades, and initiated signifi- cant investments in infrastructure, new school development, and pre-school, and summer pro- grams. 6 There is much debate over what ele- ments of reform, particularly accountability, should get credit for improvement. There is lit- tle debate, however, over whether test scores in the primary and middle grades improved. From 1995 to 2004, the percentage of CPS 8th graders whose reading test scores on the Iowa Test of Basic Skills placed them at or above national norms increased from only 29% to fully 55%. The percentage of 8th graders whose reading test scores placed them in the bottom quartile of the national distribution declined from 39% in 1995 to only 13.5% in 2004. 7

There is also evidence that when students entered high school with higher achievement test scores, they did better. In the period before 1995, dropout rates were relatively flat with approximately 18-19% of Chicago 13-year-olds dropping out by age 16. 8 Between 1996 and 2001, the percentage of Chicago 13-year-olds who dropped out by age 16 declined from 18% to 11%. There were significant decreases by age 19. 9 Improvements in graduation rates were larger for Latino and White students than for African-Americans. Consortium researchers have looked rigorously at the deter- minants of these trends using statistical meth- ods that account for changes over time in entering students’ test scores, demographic charac- teristics, and prior school histories as well as other factors. 10 These analyses conclude that most of the decline in dropout rates after 1996 can be explained by improvements in the acad- emic achievement of students leaving elemen- tary school. 11

The case of Chicago then suggests a clear strategy for improving dropout rates—focus on improving high school preparedness. This does
not have to be a solely pre-high school strategy. As Don Deschler discusses in his conference paper, another approach is to provide extra support for students once they are in high school. This is also the approach used in models such as the Ninth Grade Success Academy, discussed below. The Success Academy model goes further by combining academic support with a focus on decreasing the developmental demands and increasing academic support for students in 9th grade. Data from Chicago suggests that this second approach is equally as important.

**Strategy 2: Focus on course failure and focus on 9th grade.**

The experience of Chicago can be interpreted as either a promising or a cautionary tale. On the one hand, Chicago demonstrates that progress can be made in reducing dropout rates by improving academic achievement prior to high school. On the other hand, this same data can be used as an example of how simply giving high schools better prepared students will not solve the problem. How could it be that at a time when almost half of Chicago students were entering high school reading at or above national norms, that 11% would be dropping out by age 16 and a projected 40% would not make it to graduation? One explanation is that Chicago made little progress in improving the academic environments or instructional practices of its high schools. There is a growing recognition that the transition to high school is a critical juncture. As students move to high school, they face dramatic increases in the size and complexity of their school environments—in the number of classes and teachers they interact with, in the academic demands of their classes, and in the size of their school and peer groups—while at the same time experiencing increasing independence and declines in academic support. It is hard for any student to be "ready" to handle these new challenges without appropriate structure and support, and it is particularly hard in difficult high school environments. A significant piece of the remaining dropout puzzle lies in the difficulties students encounter as they make this transition.

Appendix A presents results from a recent Consortium report on the importance of being "on track" in the freshman year. The on-track measure is an indicator of whether students leave 9th grade ready to be promoted to 10th grade and on-track to graduation. Among freshmen who entered CPS high schools in 2000, 58% were on-track at the end of 9th grade and 81% of these on-track students graduated within four years. Freshmen who were not on-track (42% of freshmen) had a graduation rate of only 22%. Thus, students who were on-track by the end of their freshman year were more than three times as likely to graduate as those that were not on-track. Thus, many freshmen who entered high school with 9th grade test scores in the third quartile (roughly equivalent to being in the third quartile on national norms), fully 35% were off-track at the end of freshman year, and only one-quarter of those off-track graduated. Thus, many freshmen who entered high school with test scores at or above national norms had difficulty in the transition, and that difficulty was a significant predictor of whether they would graduate. What does this mean for students who fail all or most of their freshman year performance? This is their chances of graduating independent of prior achievement. Appendix A demonstrates this finding. Many students with weaker skills managed to be successful in their freshman year and, if they did so, they had much higher probabilities of graduating. This does not mean that entering test scores don’t matter. Ninth graders with lower test scores were more likely to be off-track. Whether they were on- or off-track, the lowest achieving students were also less likely to graduate than students with higher achievement. But, as seen in Appendix A, the difference in graduation rates of students across achievement levels was not nearly as large as the difference in graduation rates between those 9th graders who are on- and off-track within achievement levels.

How many of these off-track students are essentially early dropouts; students who enter high school, give up, and fail everything? Not many. Most students who are off-track are only having difficulty in one or two courses, and even one course failure in the freshman year makes it much less likely that they will graduate. Appendix B presents graduation rates by the number of semester F’s a student received in 9th grade in the four major subjects. Fully 49% of entering CPS freshmen fails one or more major subjects. Most of these students, however, fail only a limited number of courses. Nearly half (44%) of freshmen who failed courses had only one or two semester F’s, equivalent to failing both semesters of one subject. An additional 24% failed up to two full courses. Even students who had one semester failure had dramatically lower graduation rates. Freshmen who failed both semesters of a core subject were almost half (44% versus 85%) as likely to graduate as their classmates who passed all their courses. A 9th grader who fails two or fewer semesters of her regular major subject credits is an adolescent who is attending school regularly and is passing her other classes. She is a student who, for a variety of reasons, is struggling in a course or courses, and needs support. There is a group of students about who a fair all or most of their courses. But the picture that emerges is that much progress in reducing freshman failure rates can be made by improving the support, structures, and probabilities of success for those students at the margin.

One critique of this argument is that students who drop out are somehow different, despite their incoming test scores, and would have dropped out anyway. The implication of this critique is that simply getting students on track will not address their problems. Evidence from MDRC’s evaluation of the Ninth Grade Success Academy demonstrates, however, that changes in the curriculum and structure of freshman year can get students on track and that such efforts may lead to decreases in dropout rates. The Ninth Grade Success Academy is part of the Talent Development High School model. The Success Academy (see Appendix C) is designed to increase structure and support for freshmen by combining three approaches: (1) keeping groups of 9th graders together who share the same classes and same teachers in a school within the school; (2) using blocked scheduling to reduce the number of classes freshmen take and providing specialized courses for 9th graders to transition them to high school level work, and (3) providing professional development supports and structures for teachers to work together. MDRC has been evaluating the effects of the Success Academy in seven low-performing high schools in Philadelphia. These high schools experienced a 28 percentage point increase in the percentage of students passing Algebra and a 9.5 percentage point increase in the proportion of 9th graders promoted to 10th grade. Matched control high schools, in comparison, showed little improvement. Early evidence also suggests that these 9th grade improvements were sustained through 10th grade and are correspondingly translating into improvements in high school graduation rates.

**Strategy 3: Focus on recovery and keeping students on track.**

These data provoke a host of questions about what is happening in the transition to high school. Why is off-track and even one semester failure in a major subject in 9th grade such an important predictor of graduation? Part of the problem is that not only is failure commonplace in urban schools, but there is little recovery from failure. Students who fail a course, particularly one that is a graduation requirement, are immediately placed in a catch-up position. Failing a course, moreover, suggests that a student is struggling with the material, and too often in high school, the student moves on to the next semester and to the next year with little academic intervention, placing her at a high probability of failure in the next course. Most impor-
Identifying two critical groups, the early dropouts and the late dropouts.

In the previous sections, I argued that the central focus of dropout prevention should be on the high school transition—improving students’ skills before and initially upon entering high school, structuring 9th grade so that it focuses not on weeding students out but on transitioning them successfully, and monitoring progress and providing effective interventions so that students who encounter problems get support and have options to get back on track. These three core strategies will not solve the entire dropout problem and does not dismiss the notion that school systems also need to develop strong alternative programs for students who have substantial academic difficulty or for those who later may need structurally different alternatives. The data presented in this paper point to two special subgroups of dropouts. First, we saw that some freshmen were failing all of their courses and had essentially not made the transition to high school (approximately 10% of freshmen). Programs like the Ninth Grade Success Academy have had little success with this group of students either their first or second time through 9th grade. These students are essentially early dropouts and often have multiple problems in addition to low skills, and may need special intervention and/or more intensive settings. Unfortunately, few alternative high schools are set up to serve young students who have no or few credits.

A second important subgroup is students who are close to graduation and still drop out. As noted, 40% of dropouts leave high school at age 18 or older. Over 20% of these older dropouts have reached 15 or more credits and an additional 11% have 20 or more credits, very close to the 24 they need for graduation. These are students who are not dropping out because of early academic problems. They may be encountering familial, health, or economic barriers to participating fully in school. Some need help making up extra credits to graduate on time. For these students, flexible scheduling that allows them to go to high school part-time, in the evening, or in the summer is critical, as are targeted programs to support their needs. This group is important, because the investment they need is relatively small given the high payoffs of a diploma. If CPS simply decided that they were not going to allow students who were close to graduation (over 20 credits) to leave, they could reduce the number of dropouts by 5%.

Conclusion: Efforts to reduce course failure are an essential precursor to raising achievement but they will not be enough to close the aspirations-achievement gap.

Reducing high failure rates and improving 9th grade performance is the first step in raising graduation rates. It is also the first step in raising achievement in urban high schools. By not taking on the problem of freshman failure, achievement is undermined for all students. When half of 9th graders in Chicago are failing a major subject, and when even those with average to above average achievement are getting off-track, high schools are not providing environments that are engaging students in learning, setting norms and structures for performance, and laying the foundation for moving on to more advanced material. The difficulties students are having in 9th grade are undermining the rest of their school careers. Even those who pass are doing so marginally. The average core GPA in 9th grade in the CPS is 1.8, indicating deep problems in urban high schools. When students encounter disorganized environments with high rates of failure, survival becomes the focus. The survivors in these systems are paying a high price for the lack of attention to these problems. In our forthcoming report on the college transition of CPS students, we find that low GPA’s among Chicago graduates are constraining their access to college and seriously undermining their chances of being successful once there. Fully 58% of Chicago seniors graduate with less than a 2.5 GPA in their major subjects, a GPA that significantly reduces their chances of getting into four-year colleges, particularly selective four-year colleges. Low GPA’s are a particular problem for African-American and Latino students and males. At the extreme, over half of African-American males who make it to graduation leave high school with less than a 2.0 core GPA.

At the beginning of this paper, I cited the high aspirations of Chicago’s 9th graders. Getting students to pass and graduate is a first step in moving them to their goal of college, but it is only the first step. Students who fail courses are not likely to graduate from high school. Working on dropout rates means moving students from F’s to D’s, but a D average is not an average that gets you to college. Low grades do not signify that students have the skills to do well once there. Getting students college-ready requires much more. It requires moving students to B’s and A’s. It requires creating instructional programs that are getting students the credentials and skills they need for college, setting high norms for performance, and reaping around them strong counseling supports. Taking on the college problem is critically important. We cannot run urban high schools where those students who think they are playing by the rules and manage to graduate find out at graduation that they are no closer to achieving their goal of college than they were two years prior. Senior year is too late to start this work. As with dropouts, laying the foundation for college success begins in 9th grade getting them off the right start.
Appendix A

Four-year graduation rates by on-track status after freshmen year and by a student’s incoming reading and mathematics achievement: Students entering Chicago high schools in September, 2000

Source: Allenworth, E.M. & Easton, J.Q. (2005) The on-track indicator as a predictor of high school graduation. Chicago, IL: Consortium on Chicago School Research, p. 9. Note: Students who dropped out or transferred out of CPS before the end of the school year are not included in these calculations.

Appendix B

Four-year graduation rates by the number of semester F’s students received in their major subjects and the percentage of freshmen who had one or more semester F’s. Students entering Chicago high schools in September, 2000

Source: Allenworth, E.M. & Easton, J.Q. (2005) The on-track indicator as a predictor of high school graduation. Chicago, IL: Consortium on Chicago School Research. Note: Students who dropped out or transferred out of CPS before the end of the school year are not included in these calculations.
Appendix C: The Talent Development
High School Model

The Talent Development High School model brings together two high school reform approaches: (1) reforming the 9th grade through a Ninth Grade Success Academy, and (2) a whole school reform that breaks the 10th through 12th grades into smaller learning communities focused on career themes, called Career Academies. Over the past several years, MDRC has been evaluating the Talent Development Model in seven low-performing high schools in Philadelphia. While there is less evidence that the Career Academies model has been successfully implemented, the evaluation has found strong implementation and strong effects in the Ninth Grade Success Academies. Like all of MDRC’s excellent work, the evaluation takes a rigorous approach, using an interrupted time series design to compare trends over time in both treatment and matched control high schools to estimate effects.

In the Ninth Grade Success Academy, freshmen attend a self-contained school-within-a-school where they share the same teachers in an interdisciplinary team. Students take double course offerings in English and mathematics and, in the first semester, participate in courses that are designed to provide them with transitional skills that they need to move to high school level work. These courses include Strategic Reading, Transition to Advanced Mathematics, and Freshman Seminar; a course focused on study and developmental skills. In the second semester, students move to regular high school courses that are designed so that they can be on-track after freshman year. A twilight high school provides additional support for students who have discipline problems or who transfer in mid-year. Thus, the Talent Development approach structures freshman year so that it is focused on increasing students’ readiness for high school and then accelerates them (or catches them up) during their second semester. Teachers are provided professional development and curricular materials. Each interdisciplinary team shares common planning time and an implementation support team provides on-site curriculum coaches and a school-based facilitator.

In two recent reports, MDRC found strong impacts of the Ninth Grade Success Academy in improving attendance, academic course credits earned, and promotion rates. Evidence from the first three 9th grade cohorts in Philadelphia suggests that freshman year improvements were sustained through 10th grade. Early evidence from two schools demonstrates corresponding improvements in high school graduation rates. Schools in Talent Development experienced a 28 percentage point increase in the percentage of students passing Algebra and 9.5 percentage point increase in the proportion of 9th graders promoted to 10th grade. Matched control high schools, in comparison, showed little improvement. While the Ninth Grade Success Academy produced significant declines in the proportion on first time 9th graders who had to repeat freshman year, MDRC concluded that the Success Academy model was less successful with those students who still ended up repeating 9th grade.


Notes and Acknowledgements

The views presented in this paper are my own and I take full responsibility for the flaws in the argument. In this paper I draw heavily on my colleagues’ work on high schools at the Consortium on Chicago School Research, specifically Elaine Allensworth and John Easton’s work on school dropout and the importance of being “on-track” freshman year and work that was conducted with Jenny Nágoya and Gudelia Lopez on school dropout while I served as Director of Planning for the Chicago Public Schools in the Chief Executive’s Office. Many of the ideas presented in this paper have been generated through hours of conversation with my colleagues and reflect our joint analysis of problems. Specifically I want to thank John Easton, Elaine Allensworth, Jenny Nágoya, Greg Darnieder, and Gudelia Lopez who have contributed more than research findings and data analytic support to this paper. The analysis presented in this paper has been supported by grants from the Bill and Melinda Gates Foundation, the Carnegie Foundation, the Spencer Foundation and the William T. Grant Foundation.

1. Over the past three decades, the average earning and employment prospects of high school dropouts have deteriorated significantly. As a result, American taxpayers are paying a high price when a student drops out of school. Dropouts earn less, pay less taxes, are more likely to commit crimes, are more likely to need social welfare transfers, and have poorer health. (Levin and Holmes 1999). Levin and Holmes (1999) estimate that a 1 year increase in the average years of schooling for dropouts would reduce murder and assault rates by 50% and because high school graduates are less likely to commit crimes, a 1 percent increase in the high school graduation rate for men age 20 to 60 would reduce costs in the criminal justice system by 1.4 billion dollars a year (Levin, H. & Holmes, N.1999. "Op-Chart: America’s Learning Deficit." The New York Times November 6, 2005).


5. For example, from 1980 to 2002, the percentage of 10th graders from low socio-economic status families who expected to attain a bachelor’s degree or higher increased from 9.4% to fully 66.2%. (U.S. Department of Education, 2004).

6. Unpublished tabulations. The Consortium on Chicago School Research conducts biannual surveys of high school students and teachers. These results are based on the responses of 17,925 freshmen who attend Chicago public high schools in the spring of 2005.


9. The percent of students reading at or above national norms and the percent with test scores in the bottom quartile are crude indicators. These dramatic improvements in test scores in Chicago are also observed, however, if we move to more rigorous measures such as equated test scores, if we include special education students, or if we look at trends in test scores by age rather than by grade to adjust for increases in grade retention that occurred after 1996.

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11. Our analysis of cohort graduation rates follows cohorts of
15-year-olds through high school and looks at graduation
rates by age 19. Thus, we don’t have cohort graduation
rates for 13 year olds who entered high school in after 1999
because they have not yet reached 19. Among 15-year-olds
who entered Chicago high schools in the mid to late 1990s,
graduation rates by age 19 increased from 51 to 54%.

12. There were many changes in Chicago during this peri-
od in addition to the rise in elementary school achieve-
ment. The economy in Chicago was improving through-
out the 1990’s and an influx of immigrants changed the
racial and ethnic composition of Chicago students. As
noted, the 1996 reforms also brought larger initiatives in
school infrastructure, governance, and expansion of
magnet programs and schools as well as the opening of
new charter schools which offered more options at the
high school level. And, beginning with the 1996-1997
cohort, high school students were asked to complete a
more rigorous program of study. Finally, while 8th grade
test scores improved during this period, the ending social
promotion policy led to a dramatic increase in the pro-
portion of 8th graders retained, from less than 1% to
approximately 10% a year. Allensworth (2004) estimated
that students who were retained under Chicago’s policy
faced an increased risk of dropping out but that the rise in
drop out rates among the lowest achieving students was
more than offset the reduction in drop out rates attrib-
uted to increased achievement, leading to a net reduction
in dropout rates.


years, dropout rates by age 16 in Chicago declined from 16
to 11 percent. In these years, declines in dropout rates by
age 16 were associated with, on average, increases in the
proportion graduating by age 19. If we do a crude analy-
sis and simply use past trends to project out, we would pre-
dict that an 11 percent dropout rate by age 16 would lead
to an approximately 69 percent graduation rate by age 19.

from Course Failure in the Early Years of High School."

16. A student is considered on-track if she has accumulated
five full course credits (the number needed to be promot-
ed to 10th grade) and has no more than one semester F in
a core subject (English, math, science, or social studies). The
on-track indicator uses both failures in core subjects and
core credit accumulation in order to graduate students
both need to accumulate the minimum number of credits
and need to pass specific courses in the major subject areas.
This is a minimum indicator of freshman year performance
because even if a student only accumu-
lates 5 full credits in all their courses and if they fail one
semester core course, they will still need to both make that
credit up and make up even more credits to graduate.

17. Allensworth & Easton estimate that, even after control-
ling for the demographic characteristics and entering test
scores of freshmen, the predicted probability of gradu-
ation was 55 percentage points higher (81% versus 26%)
for a student who was on track versus off track at the end of
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Building a Strong Literacy Foundation for High School Excellence

Donald D. Deshler, Ph.D.
Center for Research on Learning
University of Kansas

SYNOPSIS: Given the pivotal role high schools play in developing the intellectual capital for our country's future, it is imperative that time and resources be directed at teaching the fundamental literacy to students that they should have acquired before entering high school. The key to transforming students from struggling to competent learners is to put in place programs that bring a "laser-like focus" on teaching and learning. Such efforts must start in late elementary and middle school to build a strong literacy foundation for high school excellence.

The drum beat for altering the course that many U.S. high schools are following is quickening and growing louder. For example, at the 2005 National Educational Summit on High Schools in Washington, DC, a spate of new reports underscored the pivotal role that high schools play in developing the intellectual capital for our country's future and how our high schools need to be transformed to fulfill that expectation. Two common threads ran through these reports: Standards must be raised to enable graduates to compete in the new economy and the achievement gap must be closed for the growing number of struggling adolescent learners.

The likelihood of being successful in "raising the bar" for high school graduates is extremely remote unless we find a way to simultaneously "raise the floor" for the middle-school students who are entering high school. This paper argues that the time and place to build a strong literacy foundation for high school excellence is the late-elementary and middle school years.

To help us better understand how to create a solid literacy foundation for high schools, three topics will be explored: (1) the magnitude and nature of the challenge; (2) the core elements of a solution; and (3) next steps.

The Magnitude and Nature of the Challenge

At least three key factors warrant making the upper-elementary and middle school grades the primary targets for improving the literacy levels for struggling adolescent learners: (1) the profile of struggling adolescent learners; (2) the growing expectations that are being placed on high schools to raise the standards for all students; and (3) the skill set and professional preparation of most current high school teachers. Each of these factors will be discussed below.

A Profile of Struggling Adolescent Learners

Nearly 8.7 million 4th- through 12th-grade students struggle with reading and writing tasks that are required for them to cope with the demands in their subject matter classes (Ramil, 2003). A recently completed study on 320 struggling high school freshman in a large urban district found that 74% of all 9th grade students scored at the Unsatisfactory or Basic Levels on the state assessment test in reading. Those in the Unsatisfactory Level were at the 3rd percentile in decoding and word recognition and
the 1st percentile in reading comprehension; whereas, those falling at the Basic Level were not faring much better. They were reading at the 9th percentile in decoding and word recognition and at the 8th percentile in reading comprehension (Hock, Deshler, Marquis & Deshler, 2005). Further, many adolescents report that their difficulties with reading and writing account for their decision to drop out of school (Foorman, 1998). Alarmingly, only about 70% of all U.S. high-school students graduate. Even more noteworthy is the fact that for students of color (African-American and Hispanics), this figure drops to nearly 50%.

In spite of increased attention and funding directed toward children in early elementary grades, the frequently referenced "fourth grade slump" continues to exist. Since the gap between proficient and struggling readers grows exponentially over time, the end result—nationally mandated assessment data continues to attest—is that at-risk high school students are failing on measures of reading at epidemic rates. Predictably, students who attend schools in urban and rural low-income neighborhoods are most at risk of failing to learn to read well.

A word of caution is in order here on interpreting the student performance data cited in the myriad of educational reports being issued. In short, while all states are operating under a common mandate for proficiency, there is considerable variation in the rigor of the various assessments and how states define proficiency and set cut-scores. For example, the percentage of 8th-grade students who passed the state assessment in South Carolina, Wyoming, North Carolina, and Texas was 21%, 30%, 8%, and 88%, respectively. However, when a common metric (the National Assessment of Educational Progress) the numbers look drastically different: 24% of the students in South Carolina, 34% of the students in Wyoming, 29% of the students in North Carolina, and 20% of the students scored at the proficient level (McCombs, Kirby, Barney, Darilek, & Magee, 2005).

It is important for policymakers, parents, and educators to consider the ramifications of such differences on high school performance, as well as postsecondary education and future employment opportunities. Regardless of which assessment is used, the statistics concerning the literacy competence of adolescents in this country paint a grim picture. This picture is especially troubling when viewed in relation to the growing expectations placed on those who leave high school for either postsecondary education or the job market.

Growing Expectations

The U.S. job market is undergoing dramatic changes, among other things, due to the prominent role that computers and technology are playing in our economy. The growing presence of computerization in all sectors of the economy has impacted the mix of jobs available, the way in which wages are structured, and the types of skills required of workers. On the labor market's demand side, the share of menial jobs has increased modestly, whereas the largest job growth has been in occupations requiring significant education. Specifically, it is estimated that between 2000-2010 more than two-thirds of all jobs will require some postsecondary education. The jobs requiring the most education and offering the highest pay are the fastest growing (Garcia & Deshler, 2005).

In an economy heavily influenced by computerization, the workers who are most successful are those who can engage in "expert thinking" (i.e., identifying and solving uncharted problems for which there are no rule-based solutions) and "complex communication" (i.e., interacting with others to acquire or interpret information, to explain it, or to persuade others of its implications for action) (Levy & Murnane, 2004). To perform these tasks, in these two domains, workers must demonstrate a command of critical information in an area along with an understanding of how the information is linked together and how things work. These relationships allow a person to generalize from specific cases to classes of problems—a vital skill.

These trends have very clear implications for how students spend their time in high school: They need to be taking rigorous classes that prepare them to enter into and successfully compete in this new environment. While some students are well prepared to meet these challenges, large percentages of American high school graduates are not (National Governors Association, 2005). If high schools are going to be successful in raising the bar, they need to limit the amount of time and financial resources directed at teaching the fundamental literacy skills to students that they should have acquired before entering high school. In essence, highly targeted and intensive efforts need to be directed at students during their upper elementary and middle school years.

Letting High School Teachers Do What They Do Best

In order to prepare high school students to meet the growing expectations awaiting them after graduation, high school teachers need to enhance their expertise and teaching effectiveness in their subject areas. Because knowledge is exploding and the standards students are expected to meet are being raised, it is important that high school teachers who are trained in subject-matter areas (science, mathematics, etc.) be able to add to and reframe their existing knowledge base to provide cutting-edge knowledge to their students in a learner-friendly manner. Being able to adequately prepare the existing cadre of high school teachers to meet these expectations is a daunting task—especially when between 7-15% of all high school teachers in core classes are teaching out-of-field (i.e., in content areas where they have no formal certification).

It is unrealistic to expect these same teachers to acquire a sophisticated knowledge and skill set that would enable them to teach foundational reading skills to struggling readers as well as continue to hone their subject-matter expertise; yet both are critical. Being successful in teaching reading (especially to struggling learners) requires professional preparation comparable to that subject-matter teachers acquire to teach their curriculum. Education policy supporting a practice whereby subject-matter teachers assume responsibility for large numbers of struggling readers would reduce the overall ability of these teachers to raise the standards for overall student outcomes in core curriculum areas. The result would be to compromise both the amount and quality of subject matter taught and the reading instruction offered. Thus, a long-term policy for building a strong literacy foundation for high school excellence must be grounded in strategies that address literacy problems before students arrive in high school.

Finally, research on changing schools underscores how impervious high schools can be to school reform efforts. In a large study of change in America's classrooms during the past century, Larry Cuban (1995) concluded: "The results of this study are unambiguous, at least on the subject of how much teacher change is possible: the potential for change in the practical pedagogy that teachers have constructed is far greater in the lower grades than in high school. Middle schools that have embraced elementary school-based approaches...are promising candidates for investment of resources" (p. 279). To that end, let us turn our attention to factors that are essential for closing the literacy gap in struggling adolescent readers prior to their entry into high school.

Core Elements of a Solution

A strong literacy program designed to prepare struggling readers to enter high school ready to succeed in rigorous courses is founded on three cornerstones. They are: (1) instruction as the linchpin; (2) structures that support instruction; and (3) professional development for improving instruction.

Instruction as the Linchpin

Without question, the main function of schools is to ensure that all students learn criti-
cal content and skills. Thus, the primary duty of administrators and teachers should be to ensure that instructional conditions are in place that enable students to be successful. Struggling students learn best when their teachers carefully select critical content or skills, use well-documented teaching practices, and do so in a coordinated fashion within and across grade levels. Regrettably, many secondary school administrators are not instructional leaders. While many things around a school must be taken care of (facilities, staffing, busing schedules, etc.), these things must not consume more time nor be more prominent on any agenda than instruction, learning, and student progress. Until leaders and teachers relentlessly focus on things that are core to the instructional process, student outcomes will not improve markedly (Elmore, 2005).

With specific relevance to literacy, to sufficiently accelerate the development of adolescents who are markedly behind in literacy skills, middle schools should put three things in place: (1) a screening system to determine the literacy profile/needs of struggling readers as they enter middle school; (2) a continuum of literacy services representing differing levels of intensity and instructional focus; and (3) progress monitoring to measure student responsiveness to instruction.

Screening system. A screening instrument should be administered as students enter middle school to identify the various reading needs that students have. At a minimum, such screening should give a basic measure of word analysis skills, fluency, and comprehension (the latter may not be necessary since the vast majority of students will struggle with comprehension). Further, a interpreting screening results should be clearly defined and adhered to so students get assigned to the kind of instruction that best matches their needs.

Continuum of literacy instruction. Because all the literacy needs of struggling adolescent readers are so diverse, the most effective literacy programs are ones that offer instruction at various levels of intensity, are comprehensive, and are well coordinated. For example, some students benefit when teachers use graphic organizers to help them master critical subject-matter content; others need learning strategies embedded in content material, explicit strategy instruction, or instruction in basic skills or even the basic language elements that are the foundation of literacy competence. The screening instrument mentioned above will help determine what level of literacy support is needed for each student (Lenz, Ehren, & Deshler, 2005).

Instruction that is especially intensive and focused is necessary for students reading several years behind grade level (at or below the 3rd-grade level). Classes of no more than 15 students that meet for at least one hour per day are required. A highly skilled teacher would use a combination of whole-class and small-group and one-on-one instruction. These classes should have computer technology to provide supported reading practice and quality feedback and error correction. The focus of instruction should be on word recognition, fluency, vocabulary and strategies for encouraging persistence. As students master the basic skills of reading, the instructional focus needs to shift to comprehension strategies with continued emphasis on vocabulary building. Finally, it is important to provide well-supported classroom libraries of leveled/high-interest materials that capture student interest and increase the amount of reading students do (Torgesen, 2005).

Progress monitoring. Because remedial instruction is costly (smaller class sizes, highly trained teachers, etc.), it is important to carefully monitor how responsive students are to the instruction offered and to ensure that they make sufficient progress to close the achievement gap by the time they are ready to move to high school. Measures designed to probe student performance on targeted skills should be taken at least four times per year to enable teachers to make instructional adjustments and to minimize the use of instruction that is not yielding results.

Structures That Support Instruction

In order for well-designed instructional programs to fully realize their potential, they must be supported by organizational supports. In other words, the instructional needs of students must be determined first and then organizational supports are designed to meet those needs. As Elmore (2005) succinctly states: "The schools that succeed in changing practice are those that start with the practice and modify school structures to accommodate it" (p. 4).

The structures that support an instructional mission of dramatically improving student literacy outcomes include: (1) opportunities for teachers to plan together for the purpose of coordinating instruction across classes so critical skills taught to struggling readers are reinforced and used by all teachers, thus reducing the fragmented learning experience that most secondary students encounter; and (2) flexibility in class schedules that allow students to move from one reading class to another as soon as they master targeting—even if this happens during a semester.

In short, when the overriding, relentless focus of schools becomes quality instruction, and student learning becomes a "cornerstone" of what drives a school (as argued above), organization and administrative structures and practices become variables that are continually adjusted to be responsive to instructional needs and ensure that the specified results are achieved.

Professional Development for Improving Instruction

Professional development that is coordinated, addresses major learning needs of students, is grounded in validated principles of adult learning, and is directly linked to the accountability system for teachers and administrators can be the single most important variable in improving student outcomes. While significant resources are invested in professional development in most districts, many of these funds are not clearly tied to directly improving student outcomes and are not a part of the accountability system in the district (Deninger, Curtis, & McIntyre, 2005).

Increasingly, schools have made instructional coaching one of the centerpiece of their staff development program. When properly deployed, coaches are partners in the change process. They work one-on-one with teachers to make it easier to adopt the instructional methods that can make a difference to students' success. Instructional coaches are team members, who help pull together and lead the right combination of support staff to reach common goals. Instructional coaching can be a highly effective strategy when it facilitates teacher learning around targeted student outcomes, is well coordinated and regularly measures changes in teaching practices (Knight, in press).

Next Steps

A recent study by the Consortium on Chicago School Research used an "on-track indicator" to determine the probability that a student will graduate from high school (Allensworth & Easton, 2005). Results showed that students who stay on track (i.e., earn at least five credits and have no more than one semester F in their freshman year) are three and one-half times as likely to graduate from high school than students who do not stay on track. The study highlights how devastating freshman-year failure can be. Specifically, just one semester F decreases the likelihood of graduating from 88 to 69%; a second semester F decreases the likelihood of graduating to 44%; and only 31% of students with three semester F's graduate.

These findings underscore the vital importance of making certain that middle school students enter high school prepared for the rigorous course demands they will face. The key to transforming students from struggling to competent learners is to put in place programs that bring a "laser-like focus" on teaching and learning.

For years, the majority of federal and state policies and resources have been directed at younger children. For example, in
2002, federal funding for Head Start was $6.7 billion, and for Title I in grades K-6 it was $10.49 billion. By comparison, federal funding for Title I programs in grades 7-12 was only $1.85 billion (National Center for Educational Statistics [NCES], 2004). Two relatively new federal initiatives, Reading First (for children in grades K-3) and Striving Readers (for students in grades 6-12), reflect a similar pattern of marked inequities in federal expenditures by granting $1.04 billion for Reading First versus $24.8 million for Striving Readers.

Striving Readers, while a relatively small investment, represents a symbolically important acknowledgment of the unique challenges faced by struggling adolescent readers in secondary schools. Given the importance of putting students on a solid foundation as they enter high school, it would be logical and reasonable for policymakers to insist that Striving Readers projects focus the majority of their efforts on upper-elementary and middle schools so we can quickly add to our knowledge base of how to better serve struggling adolescent readers prior to the stringent requirements they will encounter in high school.

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Balancing Content and Pedagogy in the Preparation of High School Teachers

Stephanie van Hoven, Ph.D.
University of Virginia
Thomas Fallace, Ph.D.
University of Mary Washington
William Thomas, Ph.D.
University of Nebraska
Johann Neem, Ph.D.
Western Washington University

Balancing Content and Pedagogy in the Preparation of High School Teachers

Education is increasingly important to the success of both individuals and nations, and growing evidence demonstrates that—among all educational resources—teachers' abilities are especially crucial contributors to students' learning. (Bransford, Darling-Hammond, & LePage, 2005)

Growing evidence demonstrates that effective teachers exert a powerful, long-lasting influence on their students and directly contribute to pupil achievement and learning growth (Sanders & Rivers, 1996; Stronge, 2002). These findings are emerging as demands on teachers are increasing, a context in which, as Bransford, et al. (2005) note,

Not only do teachers need to be able to keep order and provide useful information to students, they also need to be increasingly effective in enabling a diverse group of students to learn ever more complex material and to develop a wider range of skills (p. 2).

What knowledge, then, do teachers need in order to be effective? This question, or versions of this question, has long interested policy makers, researchers, practitioners, and other interested parties.

Stanford researcher Lee Shulman (1987), for example, addresses this issue by arguing that several categories should form a teacher's knowledge base, including the following: content knowledge, general pedagogical knowledge (teaching methods), curriculum knowledge, knowledge of learners and their characteristics, knowledge of educational contexts, and knowledge of educational ends, purposes, and values, and their philosophical and historical grounds (p. 8). Most importantly, Shulman asserts, teachers should possess pedagogical content knowledge, which he defines as:

The blending of content and pedagogy into an understanding of how particular topics, problems, or issues are organized, represented and adapted to the diverse interests and abilities of learners, and presented for instruction (p. 8).

Pedagogical content knowledge also includes, according to Grossman, Schoenfeld, & Lee (2005),

The ability to anticipate and respond to typical student patterns of understanding and misunderstanding within a content area, and the ability to create multiple examples and representations of challenging topics that make the content accessible to a wide range of learners (p. 201).
Thus, Shulman and others emphasize the need for teachers to possess a deep, flexible, and confident understanding of the subject matter, an understanding that allows the teacher to connect the content to students and to make the content relevant and meaningful (Bransford, 2000; Grossman, Schoenfeld, & Lee, 2005; Grossman, Winsburg, & Woolworth, 2000; Shulman, 1987; Shulman & Sherin, 2004). An effective teacher understands the world of the student and finds a way to connect to the world with the strong academic content that needs to be taught. To be able to do this, a teacher needs to possess a strong background in the subject matter, a deep knowledge of how to teach the content, and rich understandings of how to build a bridge between students' lives and the content being studied. Placed within a teacher education context, the question is, how does this come to be? In other words, how do we prepare teachers to possess this knowledge?

What experiences should be included in a teacher preparation program that allows future teachers to develop this type of knowledge? In this paper, we explore these issues through the lens of history education, specifically focusing on teacher preparation at the University of Virginia and our quest to balance and bridge teacher understandings of content, pedagogy, and pedagogical content knowledge.

The Case of History: What Knowledge Do Teachers Need?

A 2001 study conducted by the National Assessment of Educational Progress (NAEP) revealed that 57 percent of American high school seniors scored "below basic" in their knowledge of American history. This added fuel to an ongoing debate over what history teachers should know, and whether the content background (or lack thereof) of history teachers was correlated to poor student performance on the NAEP. Pulitzer-Prize winning historian David McCullough, for example, in his testimony to a Senate hearing asserted that too many history teachers "have degrees in education and don't really know the subject they are teaching." To McCullough and others, if teachers had more historical knowledge they would be better teachers and students would earn higher scores on the NAEP exam. Simply put, if teachers knew more history, more content, they would teach it better. As noted earlier in this paper, other groups, however, assert that content knowledge is only one facet of what history teachers need to know. Experts on teaching and learning call for attention to Shulman's (and others) contention that a teacher's knowledge base should also include attention to knowledge of learners, curriculum, pedagogy, and pedagogical content knowledge.

The National Research Council (2000) builds upon Shulman's definition and specifically describes pedagogical content knowledge for history teachers in this way:

For expert history teachers, their knowledge of the discipline and belief about its structure interacts with their teaching strategies. Rather than simply introduce students to sets of facts to be learned, these teachers help people to understand the problematic nature of historical interpretation and analysis and to appreciate the relevance of history for their everyday lives. (p. 159)

Evidently, many educational researchers recognize and insist upon the need for teachers to know the content (the facts) of history, but also call for attention to methods, mentalities and structures of the disciplines, which can then be translated into pedagogical content knowledge. History teachers absolutely need to know their content and the facts of history, but they also need to know how to teach it, to possess a rich understanding of the nature of history and what historians do, and to understand how to connect this to students in their high school classroom.

The debate over content versus pedagogy continues, however, and throughout the discussion certain caricatures of both sides have emerged: educators support thinking without knowledge, historians support knowledge without thinking. This, we argue, is an artificial dichotomy of historical facts versus skills and historical content versus pedagogy. Such a divide, we suggest, is neither useful nor accurate. If we can move beyond the divide, we might better understand how history teachers should be trained and, by extension, what students should be taught. This raises a question, however—how to build the bridge between the content matter and the pedagogy?

Building a Bridge: The University of Virginia

The University of Virginia's Curry School of Education offers future teachers an intellectually rigorous teacher preparation program that requires a major in a content area (i.e., psychology, biology, history, etc.), coursework in pedagogy, and an extensive clinical classroom-based component. Two groups of students comprise the teacher education candidates: Bachelor of Arts/Master of Teaching (BA/MTs) and Post-Graudate/Master of Teaching (PG/MTs). BA/MTs are University of Virginia undergraduates who apply to the Curry School of Education in their first or second year and who graduate from the teacher education program with a Bachelors of Arts and a Masters of Teaching. PG/MTs are students who have already earned a Bachelors of Arts and who have decided to enter the teaching profession. They complete a two year Masters of Teaching program. As part of the teacher education program, students complete a series of general methods courses, extensive and intensive field experiences, as well as subject-specific pedagogy courses. Thus, future teachers encounter content in the arts and sciences classes required for their content major; they learn about specific ways to teach in their education course (pedagogy) and they are mentored as they integrate the two components in their ongoing clinical experiences.

Traditionally, however, as students have learned their content in their arts and sciences course work and pedagogy in their education classes, they have viewed the two as separate entities. This troubled us—we were concerned that students did not grasp the connection, that an effective teacher needs both content and pedagogy. University of Virginia's participation in the grant supported initiative, Teachers for a New Era, allowed us to grapple with this essential question and to develop different ways to build bridges between the College of Arts & Sciences and the Curry School of Education. Teachers for a New Era (TNE) (http://www.teachersforanewera.org), sponsored by Carnegie Corporation of New York with additional support from the Annenberg Foundation and the Ford Foundation, is a reform initiative designed to stimulate construction of excellent teacher education programs at selected colleges and universities. Three general design principles inform the institutions participating in TNE: 1) respect for evidence, including attention to pupil learning gains accomplished under tutelage of graduates of teacher education programs; 2) engagement of arts and sciences faculty in the education of prospective teachers; and 3) understanding teaching as an academically taught clinical practice profession that requires close cooperation between colleges of education and arts and sciences.

One outcome of the University of Virginia's participation in the TNE initiative is increased attention to ways in which the Curry School of Education and the College of Arts and Sciences can work more closely to produce high quality teacher candidates. In particular, we engaged in discussion about how to create a meaningful link, a "bridge" between the two schools. This led to the development of several initiatives, including the following: altering the advising structure, offering common courses with a focus on examining a major topic from multiple perspectives, developing shared research agendas, and creating Counterpoint Seminars. Counterpoint Seminars, tied to arts and sciences survey courses, are designed to encourage students to think about issues of content and pedagogy in relation to one another. In other words, they offer an opportunity for students to engage more deeply in their discipline (content), while exploring the connections to K-12 student learning.
The Counterpoint Seminars are co-taught by two advanced graduate students—one with a background in the relevant arts and sciences discipline, the other with a background in education (as well as K-12 teaching experience), under the guidance of a faculty member of each school. Thus far, the university has offered Counterpoint Seminars in Literature, American History, and Astronomy, and will be offering one in World History in Spring 2004. In this paper, we discuss the American History Counterpoint Seminar offered in conjunction with HUS 202: United States History 1865-present.

The American History Counterpoint Seminar

The American History Counterpoint Seminar was offered in the Spring of 2004. Four people collaborated in the creation and implementation of this seminar: Professor William Thomas, an arts and sciences faculty member (now on the faculty at the University of Nebraska) who taught HUS 202; Professor Stephanie van Hoven, faculty coordinator of the social studies teacher education program at the University of Cincinnati's Curry School of Education who teaches the secondary methods (pedagogy) course; Johann Neem, (now on the faculty of Western Washington University) then an advanced doctoral student in the history department; and Thomas Fallace (now on the faculty of University of Mary Washington), then an advanced doctoral student in the social studies education program at the Curry School. The students who participated in this American History Counterpoint Seminar were enrolled in the secondary (grades 6-12) social studies teacher education program as either BA/MTs or PG/MTs.

When we sat down to plan for the Counterpoint Seminar, we discussed the need for our students to delve more into the epistemology of history and to draw connections between the content courses and their pedagogical courses. As the Counterpoint Seminar was designed as a bridge between the College of Arts and Sciences and the Curry School of Education, we hoped to explicitly connect learning about history to teaching it and to complement existing courses in history and social studies education—not to replace them. Thus, the Counterpoint Seminar offered a perfect intersection between content and pedagogy, a forum in which to focus on pedagogical content knowledge. We concluded that focusing on the course on what historians refer to as "historiography" would allow us to enrich students' pedagogical content knowledge.

We began with an inquiry into history itself. Of course, history is composed of facts. Every American citizen should know that Thomas Jefferson penned the phrase "life, liberty, and the pursuit of happiness" in the Declaration of Independence. Such an assertion is undisputed. Exactly what he meant by these words, however, is disputed and always will be. To make meaning of the facts, historians link them to countless other facts and in the process offer their own interpretations. Historians then argue about each other's interpretations by drawing attention to other facts and issues. Unfortunately, textbooks leave this process out by presenting these interpretations implying that history is nothing more than an undisputed list of facts. In the counterpoint course, we wanted to provide the teacher candidates with a deep knowledge of the process of writing history and the dynamic nature of the discipline, as well as focusing on how to connect this to high school students.

Historiography is the set of secondary writings produced by historians about the past. It includes conflicting articles and books about a particular historical topic. These works are centered on specific questions such as "what caused the Civil War?" To a professional historian, the causes of the Civil War are always being reinterpreted either because new methods are developed to study the past, or because new evidence has been discovered that changes what we thought we knew. An historiographical essay on the Civil War would examine historians' writings on the Civil War over time, stressing how new methods, new evidence, and new questions have changed our understanding of it.

We decided to instruct our history teacher candidates to think historiographically. We wanted them to understand that historians are always engaged in debates about the past. These debates are expressed not only in published articles and books but also in the classroom when professors lecture. Historians always frame their understanding through historiography. They read a lot of history—meaning historical studies about the past that arrange and interpret the facts—and then they make judgments about which analyses they find more convincing. We hypothesized that if we introduced our students to historiography, they could make their classroom instruction more engaging, accurate and effective (Fallace & Neem, 2005).

To make it clear what we mean by historiography, let's look at one particular example. In his best-selling new book 1776, David McCullough drew upon a variety of primary and secondary sources to depict the events of that year. His narrative particularly focused on the numerous adversities that General George Washington and his Continental Army had to overcome in order to win the war. The objective of this book was to remind Americans about the difficulty of the early years of the Revolution and that creating a democracy takes patience, perseverance, and hard work. Historian Gary Nash recently published another book of this kind entitled The Unknown American Revolution. Nash focused on competing American factions and the mistreatment of Native and African Americans. Nash reminded readers that not all Americans were united in their support of liberty, nor did all have something to gain from independence. While both accounts rely on facts, the authors chose to organize them in different narrative frameworks and use them towards different ends. Taken together these two texts are considered part of the historiography of the American Revolution. A thoughtful reader would seek to make sense of these divergent narratives and make judgments about their relative merits—judgments based not on opinion but on the evidence and methods the two writers used.

Our class introduced historiography to the prospective teachers through the reading of historiographical essays. For example, they read about different historical interpretations of the Progressive Era. In addition to readings in history, we explored texts on educational theory, social studies theory, and the writing of textbooks. For us it was important that the course readings presented a range of orientations to both history and pedagogy. The teacher candidates were confronted with a variety of interpretations of historical events. In addition, they were introduced to a range of answers to such questions as: what is the purpose of learning history, what is the nature of historical knowledge, what historical content should be selected, in what manner should it be taught, and how is it related to citizenship and the state?

The students were encouraged to make a direct connection between their new historiographical knowledge and their future classroom teaching. This connection was the focus of their final project. They were required to select a broad historical topic of their choice in American history and then gather and analyze historiographical essays about the different historical interpretations of that period. They were also asked to develop a teaching rationale based on the educational readings, and then design a teaching unit with their rationale. In this manner their content and pedagogical thinking was explicitly linked.

Our students chose such topics as Reconstruction, westward expansion, the Gilded Age, the Cold War, and the 1960s. Their final projects were consistently strong, demonstrating that we achieved our class objectives. One of our teacher candidates wrote "...this class has introduced to me an important way of considering history, one that my teachers in the past failed to present. While coming to grips with this new way of thinking has been difficult for me, and at times, I wished I was still in the dark," I believe that in the future I will find that this experience will make me a better teacher."

We believe that this course fundamentally changed the way these future teachers
approached the discipline of history and their views on how to teach it. The course provided more "content" knowledge about the past by reading and talking about historical works, made students aware of important historians and their work, equipped them to be critical readers of all historical accounts, and increased their understanding of how the discipline works. By linking their new understanding of the discipline as both content (facts) about the past and an interpretive art (skills), we provided them with a richer model of what it means to know history. We also suggest that, as educators, their understanding of the historical discipline should influence what they teach and how they teach it. Perhaps most importantly, we provided them with the intellectual tools to continue their own future professional development by keeping up with the latest developments in the field.

One of the students is now in his second year of teaching world history at a high school in Virginia. Regarding the impact the course had on his teaching, he had the following to say:

"This course was the keystone for my understanding of the field of history. It was not a case of the word historiography even before it and now I use it in my own life and classroom quite frequently. At the beginning of each school year, I discuss with my students the processes that go into writing history, especially the tertiary nature of textbooks and how we are often the result of changed paradigms by historians doing more focused research at the top of their field. If anything, this course renewed my interest in history because I realized that "dead" topics, such as the Ancient World History that I teach, are in fact very much alive and are debated widely today. As a result, I attempt to read more recent research from historians (and sometimes archaeologists) to get a better sense of what the commonly held theory or theories are. Additionally, I have gone as far as to explain these different schools of thought to my students in order to demonstrate that history is not "a branch of facts to be memorized," but is something to be debated."

Reflections and Recommendations

We believe that it was crucial that this course was co-taught by a historian and social studies educator, each of whom held a deep respect for the other's domain. The instructors agreed on the objectives of the course and their presence in the classroom ensured that both sides would be represented equally. It was also important that this course was viewed as a bridge between the School of Arts and Sciences and School of Education, not as a replacement for the coursework in either. Both knowledge bases are equally important for successful teachers. This initiative was launched in order to strengthen the connection between the two, to blend the areas into new pedagogical content knowledge, not to "step on the toes" of either. Therefore, if such a class were to be taught elsewhere, the instructors should have a full understanding of the programs they are hoping to bridge. And, as the above approach is applied to other disciplines—history, literature, science, and math—teachers should be encouraged to learn more about their discipline, not just to take more classes in "content." This would mean that the relevant departments would need to work with the corresponding education departments to ensure that teacher candidates are given opportunities to engage with their discipline and link it to new ways of thinking about their teaching—ways that combine factual knowledge with disciplinary skills and pedagogical techniques and that develop pedagogical content knowledge. In doing so, we hope that America's students will themselves gain a richer understanding of the relevant facts and how to make sense of them. This, we believe, is the heart of a democratic education.

We know that teachers exert a powerful, long-lasting influence on their students, and that effective teachers know their content, know their students, and understand how to make content meaningful and relevant for their students. And, we know that it is important to ensure that teachers enter the classroom understanding content, pedagogy, and pedagogical content knowledge. The Counterpoint Seminar represents one facet of an ongoing collaboration between the University of Virginia's Curry School of Education and the College of Arts and Sciences, but it is a powerful example of a successful attempt to build a strong bridge between teachers' understanding of content, and teachers' understandings of how to make that content meaningful to students (pedagogical content knowledge). Additionally, as Grossman, Wineburg, and Woolworth (2001) note, effective teachers engage in, and model for their students, lifelong learning, and continue to grow in knowledge, breadth, and understanding and keep up with changes and paradigm shifts in their disciplines (p. 14). The Counterpoint Seminar has the potential to teach future teachers these skills. In sum, the model of the Counterpoint Seminar offers one way in which we can create links between deep disciplinary knowledge and student learning and help turn academic content into a "teachable" subject.

References:


Emerging Strategies for Strengthening American High School Mathematics Education

Uri Treisman, Ph.D.
* Professor of Mathematics and
Executive Director, Charles A. Dana Center for Mathematics and Science Education
The University of Texas at Austin

Background

As the nation enters the third decade of standards-based education reform, policymakers at all levels are turning their attention to the American high school. Studies abound documenting the failings of the comprehensive high school and, perhaps more significantly, of the state and local policies that define the content of a high school education. In the most pointed and comprehensive of these studies, Achieve, an organization created by the nation’s governors and business leaders, found that “No state requires its graduates to take the courses that reflect the real-world demands of work and post-secondary education” (Achieve, 2004, page 5).

Despite the pervasive rhetoric in news coverage regarding the overgrowth of service jobs in the United States, approximately one-third of new jobs require a baccalaureate degree and an additional third require at least some postsecondary education (Carnevale and Desrochers, 2003). Achieve found that, to prepare for the demands of higher education and today’s high-quality workplaces, high-school students, in addition to completing courses that develop strong writing, reasoning, logic, and communication skills, must master four years of rigorous mathematics, including Algebra I, Geometry, Algebra II, and data analysis and statistics. Adding urgency to Achieve’s findings is a recent study by the U.S. Department of Education, The Toolbox Revisited: Paths to Degree Completion from High School Through College (Adelman, 2006), which found that the rigor of a student’s high-school curriculum is the strongest predictor of whether he or she will complete college—and this rigor is even more important than grades and standardized test scores. The study found, furthermore, that successful completion of advanced mathematics courses is especially highly correlated with postsecondary success.

Building the capacity of American high schools so that the great majority of students graduate with substantive mathematics knowledge and skills is a daunting challenge worthy of policymakers’ attention and leadership. In a closed-door session of governors and senior education policymakers at the 2006 National Education Summit on High Schools, there was broad consensus that the greatest obstacle to substantially raising high school standards, especially in mathematics, is the lack of public will to act. Confirming this view, a recent poll by Public Agenda (February 15, 2006) found that 57 percent of parents believe that their children are already learning enough math and science (Education Insights, Public Agenda, 2006).

More troubling is that a similar poll by Public Agenda conducted in 1994 found that more than half of U.S. parents believed that inadequate math and science education was a serious problem for their children’s futures. In the 2006 poll, fewer than one-third of parents held this view.

Fortunately, high-school students’ sense of the importance of mathematics is more on
A clear picture of our mathematics education strengths and weaknesses emerges from a close look at the performance of our eighth graders in cross-national studies. While it is true that American eighth-graders typically perform in the middle of the pack in these international comparisons, it is also true that the state in which a student goes to school has a tremendous effect on his or her performance. In 1999, for example, thirteen states participated as countries in a re-administration of the eighth-grade Third International Mathematics and Science Study (TIMSS; now known as the Trends in International Mathematics and Science Study), perhaps the best known and best designed international comparison of mathematics performance (National Center for Education Statistics, Trends in International Mathematics and Science Study, 1999). Some states, like Texas and Michigan, scored at very high levels, whereas others, including Missouri, were near the bottom of the international list. Texas, whose sample contained more than 50% African-American and Hispanic students, performed at a significantly higher level than most European countries. Thirteen percent of Texas students scored in the top decile, and 37% scored in the top quartile, of international performance.

Thus, our country, when looked at state by state, reflects extremes of high and low achievement not well understood by national experts or, as might be expected, by the voting population. The recently released 2005 National Assessment of Educational Progress (NAEP), known popularly as the Nation's Report Card, also shows profound and disturbing differences among states in eighth-grade mathematics performance (National Center for Education Statistics, 2005). Forty years ago researchers established that demographic variables such as race, ethnicity, class, and parent's education were the principal determinants of children's academic performance. Today, while these background characteristics still matter, the more significant variable is where they live and go to school.
A glance at the 1990 NAEP data shows that sixteen years ago, the average performance of eighth-grade students of a given race or ethnicity was nearly the same whether the students went to school in California or Texas (National Center for Education Statistics, 1991). In 2005 that was no longer true!

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Two University of Pennsylvania researchers (Bec and Shin, 2005) recently reanalyzed scores from several large-scale cross-national studies and found that white students in the United States consistently outperform the predominantly white student populations of several other leading industrial nations. There is "compelling evidence," they write, "that the low scores of ... [black and Hispanic students] were major factors in reducing the comparative standing of the U.S. in international surveys of achievement. If these minority students were to perform at the same level as white students, the U.S. ... would lead the Western G8 nations in mathematics and science, though it would still trail Japan in these subjects."

One of the crucial but overlooked lessons of comparative studies of educational performance is that achievement differences within and across states and countries are merely reflections of differences in the rigor of the curriculum taught to the typical student. When U.S. students take rigorous AP courses, they perform as well or better than their international peers. When states require that students take substantial math courses, the number of students of all backgrounds performing at high levels increases dramatically. The challenge is to build the capacity of school systems to offer all their stu-


Promising Practices

Perhaps the most important lesson to be gleaned from NAEP data comparing the mathematics performance of elementary and middle school students across states is the power of organizing school improvement around the implementation of a high-quality curriculum in all classrooms. In such "managed curriculum" strategies, professional development supports teachers in implementing a comprehensive set of high-quality lessons. In such approaches, teachers spend more time deciding how to teach than deciding what to teach. They are, in this respect, more like professional musicians than composers. In a managed curriculum approach to school improvement, school leaders are trained to assess the quality of learning that occurs as teachers implement lessons and to provide support for ever-continuing instructional improvement. In the best cases, these programs, which exist primarily at the K-8 level, are driven by complex multidimensional formative assessments that provide teachers, coaches, and instructional leadership teams with the data they need to identify and drive improvements.

The strongest of these curricula balance a focus on powerful "big ideas" with explicit supports for developing fluency in essential computational algorithms. They also are structurally transparent: it is easy to trace the development of important ideas across grade levels and to see for each key concept the places where students develop the necessary skills and intuitions to use the ideas with power.

Some form of a managed curriculum strategy is now in place in all the high-performing urban districts in the National Center for Education Statistics' Trial Urban District Assessment.
None of the low performers on the Trial Urban District Assessment are using a managed curriculum strategy to improve their mathematics performance. The NAEP data show that students in a district using a managed curriculum approach outperform (by grade 8) their peers in more traditionally structured districts by almost two grade levels. Moreover, there is growing evidence from internal district studies that the principal beneficiaries of a managed curriculum are poor children. These students, subject to higher family mobility, change schools more often than their wealthier peers and thus benefit from policies that provide consistency in what is taught. Their greater success liberates time and funds that are otherwise spent on intervention, remediation, and disciplinary strategies.

A central challenge for leadership is to define and implement an analog of effective K-8 managed programs in high schools. Perhaps the most promising attempt to move in this direction is in Chicago, where the district, with the support of the Bill and Melinda Gates Foundation, is planning to implement a managed curriculum system in 50 large high schools over the next three years. This represents an ambitious goal for a system which, for 40 years, has prized not just school choice in curricula but individual teacher choice.

Driving improvement with a managed curriculum strategy stands in sharp contrast to improvement strategies driven by big ideas or abstract principles of learning. In complex systems, big ideas alone are not enough: without a detailed plan for shaping what happens in the crucible of everyday instruction, the result is that high levels of achievement are never attained by the great majority of students. For too many teachers with complex lives and daunting responsibilities, the distance from abstract principle to practice is just too large. Many now believe it’s time to focus on construction-engineering solutions to improvement, not just on elegant architectural drawings.

Efforts to implement managed curriculum strategies must be reconciled and articulated with both those forces that support stability and those important efforts to introduce innovation into high school education—the small schools movement is just one of the most publicized of many innovations under consideration or testing. As large districts create greater numbers of innovative schools and charters, the challenge of maintaining coherence and high standards will be formidable.

The Urban Mathematics Leadership Network
Organized by Achieve and the Charles A. Dana Center at the University of Texas, the Urban Mathematics Leadership Network is a consortium of 14 large urban districts seeking to develop common tools and strategies for strengthening high school mathematics teaching and learning. In the most recent meeting of the Urban Mathematics Leadership Network, district leaders identified priority areas where the use of well-developed sets of tools and protocols would likely lead to significant improvements in district programs, and thus to gains in student learning. The use of common instruments would allow mathematics leaders to learn more efficiently from one another. And learning from practice would be accelerated if implementation tools were designed to capture important data about core processes and outcomes of teaching and learning.

While the presumption is that participating districts would be moving to a managed curriculum strategy, the leaders recognize the differing demands of state standards and of local curricular preferences on district curriculum choices. The UMLN priorities demonstrate the power of federal education policy, and, in particular, of No Child Left Behind, to focus local education leaders’ attention on the learning needs of low-income and ethnic and racial minority students as well as on the needs of struggling learners. The UMLN priorities follow.

1. Develop a set of resources for systematically cross-training mathematics professional development staff and those responsible for improving the teaching of English Language Learners.

New York City has developed and implemented over the last two years a novel set of strategies for co-training those responsible for supporting mathematics improvement and those responsible for helping students master academic English. These protocols should be refined based on district studies of their effectiveness and enhanced by current research on academic language acquisition, which has, for example, identified particular mathematical language structures that cause special difficulty for Spanish-speaking students.

2. Create a set of resources for strengthening the mathematical knowledge of special education district leaders and for those who work with students who have Individual Education Plans.

Very few of the individuals who work with special education students have the skills to support mathematics learning in the early grades, let alone in high school. We must identify strategies tied to core lessons in a managed program that can be adopted by special education staff responsible for nurturing student success in mathematics classes. New York City has organized a summit on mathematics and special education in which some promising strategies have been proposed. These need to be vetted by experts and incorporated into instructional and professional development programs. There needs to be a major national research effort to increase our understanding of the challenges faced by struggling learners of mathematics and to develop strategies to explicitly address these challenges.

3. Systematically incorporate research-based strategies for helping struggling adolescent readers into the core mathematics lessons of a managed instructional program.

One advantage of a managed curriculum strategy focuses on providing the teaching of exemplary lessons is that new knowledge on adolescent literacy development can be incorporated directly into lesson plans and into the training of coaches and others who support instruction. Good mathematics lessons should also be good literacy lessons, characterized by prior knowledge checks, prereading of tasks, attention to especially important linguistic structures (such as those related to mathematical implication and naming), and structured reading and writing.

4. Develop a set of diagnostic tools for assessing algebra readiness that can be used to place students in intensified ninth-grade algebra programs.

There is now convincing evidence that two-year "slow" algebra programs do not prepare students for success in later mathematics classes. If students are behind, slowing them down will not help them to catch up. These slow courses should be replaced with intense, highly structured double-period algebra courses that incorporate structured skill development into daily routines. Syllabi for double-period algebra classes such as those being used in the Evanston Township High School District should be further developed and put into use.

5. Build a system of Academic Youth Development strategies that make it easier for students to make positive academic choices—and much harder for them to make bad choices. Organize these programs in ways that shape a positive culture of learning in high school mathematics classes.

Only a relatively small percentage of students who fail algebra fail only algebra. There is now overwhelming evidence that programs like C-Grid, AVID, and Chicago’s Step-Up to High School and Ninth Grade Success Academy programs not only can dramatically increase students’ motivation to succeed academically in all their courses but also can provide students with the academic skills necessary to succeed in challenging mathematics courses. These programs dramatically reduce
the ninth-grade failure rates of students, which, as Melissa Roderick documents in her paper, is a critically important factor in helping students graduate from high school on time. With the support of the Spencer Foundation, the Dana Center and the Minority Student Achievement Network are creating a mathematics-focused version of an academic youth development program that is explicitly designed to improve algebra achievement. This initiative is incorporating into protocols recent advances in developmental and social psychology by Catherine Good, Joshua Aronson, and other applied psychologists focused on improving school outcomes of "at-risk" children.

6. Enhance high-quality teacher induction programs, such as that created by the Santa Cruz New Teacher Center, with a mathematics component focused on helping teachers manage a diverse set of high-quality lessons. There is now strong evidence that some induction programs can have substantial effects on both teacher retention and student learning. The work of the University of California at Santa Cruz's New Teacher Center has been particularly impressive and is now spreading quickly to urban districts. These modern induction strategies could be even more effective if they also addressed the skills necessary to teach model lessons as part of a managed curriculum strategy. Several districts in California, including the Fremont Union High School District, have begun this mathematics-enhancement of the Santa Cruz project, with promising effects.

8. Collaborate with groups like the New Teacher Project to recruit into mathematics teaching mid-career professionals, and collaborate with such groups to develop appropriate induction supports. There is growing evidence that young workers are less likely than their forebears to start a career with the intention of making it their life's work. Thus, it makes sense to explicitly recruit midcareer professionals into mathematics teaching for the labor force stability that such recruitment might provide. These individuals might benefit from a customized induction experience that capitalizes on their life experience and maturity.

9. Use modern technology to support the implementation of high-quality instruction, to gather data for strengthening program implementation, and to support the needs of special populations of students. Teachers desire the kinds of productivity and data-mining tools that are commonplace in professions such as medicine, architecture, and law. Sophisticated systems like Agile Mind (a public-private collaboration incubated by the Dana Center and its commercial partners with the help of the Hewlett and Irvine Foundations) provide not only just-in-time support for teachers, but data to drive lesson study and program improvement. Technology-mediated support systems that incorporate the kind of data-mining engines central to Amazon and E-Bay also allow district leaders to develop a powerful evidence base for their instructional support programs.

10. Create mechanisms for new knowledge creation that reflect the needs and timelines of education leaders. As many critics of education research and development have pointed out, education suffers from collective amnesia. It is unnaturally difficult for practitioners to learn systematically from the hard-earned experience of their peers. We need to build structures that allow efficient learning, tool and strategy development, and, when needed, the creation of new knowledge on a time scale that reflects the realities of public education systems. Such structures should be controlled by the districts that sponsor them. One promising model for such structures is the Strategic Education Research Partnership (www.seripr institute.org) birthed by the National Research Council. SERP has shown that it has the ability to attract leading researchers to its design teams. The first SERP lab site is in the Boston Public Schools and is focused on the development of effective adolescent literacy strategies.

Conclusion
At the close of the 2005 National Education Summit on High Schools, Achieve and thirteen states formed the American Diploma Project, committing themselves to raising the rigor of their high school standards, assessments, and curricula, and to better aligning these newly raised expectations with the demands of post-secondary education and high-quality workplaces. The positive news is that the American Diploma Project network has grown rapidly to 22 states, which together educate approximately half of all U.S. students. In the national interest, all states must sign on to this agenda. But raising standards will have little meaning if states do not build the capacity of their schools to offer all their students rigorous courses that reflect these higher standards. In addition to serving as a clearinghouse and disseminator of effective practices, the federal government must partner with states to build this needed capacity. But what should be the federal government's priorities?

A compelling response is offered in Recommendation A of the National Academy of Sciences report: Rising Above the Gathering Storm. Reproduced in this paper's appendix, this recommendation consists of a set of three actions that would increase America's talent pool by vastly improving K-12 science and mathematics education. These actions would lead to significant increases in the number of new, well-trained mathematicians and science teachers, in the skills of 225,000 current teachers of mathematics and science, and in the number of students taking rigorous college-level mathematics and science courses while still in high school. It is a bold recommendation worthy of our collective attention.

Appendix


10,000 TEACHERS, 10 MILLION MINDS, AND K-12 SCIENCE AND MATHEMATICS EDUCATION

Recommendation A: Increase America's talent pool by vastly improving K-12 science and mathematics education.

Implementation Actions
The highest priority should be assigned to the following actions and programs. All should be subjected to continuing evaluation and refinement as they are implemented.

Action A-1: Annually recruit 10,000 science and mathematics teachers by awarding 4-year scholarships and thereby educating 10 million minds. Attract 10,000 of America's brightest students to the teaching profession every year, each of whom can have an impact on 1,000 students over the course of their careers. The program would award competitive 4-year scholarships for students to obtain bachelor's degrees in the physical or life sciences, engineering, or mathematics with concurrent certification as
12 science and mathematics teachers. The merit-based scholarships would provide up to $20,000 a year for 4 years for qualified educational expenses, including tuition and fees, and require a commitment to 5 years of service in public K-12 schools. A $10,000 annual bonus would go to participating teachers in underserved schools in inner cities and rural areas. To provide the highest-quality education for undergraduates who want to become teachers, it would be important to award matching grants, on a one-to-one basis, of $1 million a year for up to 5 years, to as many as 100 universities and colleges to encourage them to establish integrated 4-year undergraduate programs leading to bachelor’s degrees in the physical and life sciences, mathematics, computer sciences, or engineering with teacher certification. The models for this action are the UTeach at the University of Texas and California Teach at the University of California.

Action A-2: Strengthen the skills of 250,000 teachers through training and education programs at summer institutes, in master’s programs, and in Advanced Placement (AP) and International Baccalaureate (IB) training programs. Use proven models to strengthen the skills (and compensation, which is based on education and skill level) of 250,000 current K-12 teachers.

• Summer institutes: Provide matching grants to state and regional 1- to 2-week summer institutes to upgrade the skills and state-of-the-art knowledge of as many as 50,000 practicing teachers each summer. The material covered would allow teachers to keep current with recent developments in science, mathematics, and technology and allow for the exchange of best teaching practices. The Merck Institute for Science Education is one model for this action.

• Science and mathematics master’s programs: Provide grants to research universities to offer, over 5 years, 50,000 current middle school and high school science, mathematics, and technology teachers (with or without undergraduate science, mathematics, or engineering degrees) 2-year, part-time master’s degree programs that focus on rigorous science and mathematics content and pedagogy. The model for this action is the University of Pennsylvania Science Teachers Institute.

• AP, IB, and pre-AP or pre-IB training: Train an additional 70,000 AP or IB and 80,000 pre-AP or pre-IB instructors to teach advanced courses in science and mathematics. Assuming satisfactory performance, teachers may receive incentive payments of $1,800 per year, as well as $100 for each student who passes an AP or IB exam in mathematics or science. There are two models for this program: the Advanced Placement Incentive Program and laying the Foundation, a pre-AP program.

• K-12 curriculum materials modeled on a world-class standard: Foster high-quality teaching with world-class curricula, standards, and assessment models of student learning. Convene a national panel to collect, evaluate, and develop rigorous K-12 materials that would be available free of charge as a voluntary national curriculum. The model for this action is the Project Lead the Way pre-engineering courseware.

Action A-3: Enlarge the pipeline of students who are prepared to enter college and graduate with a degree in science, engineering, or mathematics by increasing the number of students who pass AP and IB science and mathematics courses. Create opportunities and incentives for middle school and high school students to pursue advanced work in science and mathematics. By 2010, increase the number of students who take at least one AP or IB mathematics or science exam to 1.5 million, and set a goal of tripling the number who pass those tests to 700,000. Student incentives for success would include 50% examination fee rebates and $100 mini-scholarships for each passing score on an AP or IB science or mathematics examination.

Although it is not included among the implementation actions, the committee also finds attractive the expansion of two approaches to improving K-12 science and mathematics education that are already in use.

• Statewide specialty high schools: Specialty sec-

ondary education can foster leaders in science, technology, and mathematics. Specialty schools immerse students in high-quality science, technology, and mathematics education; serve as a mechanism to test teaching materials; provide a training ground for K-12 teachers; and provide resources and staff for summer programs that introduce students to science and mathematics.

• Inquiry-based learning: Summer internships and research opportunities provide especially valuable laboratory experience for both middle-school and high-school students.

References:


The Challenge of High School Reform

CONFERENCE PARTICIPANTS

Montego Bay, Jamaica
February 21-26, 2006

Members of Congress

Senator Lamar Alexander
and Honey Alexander

Representative Michael Castle
and Jane Castle

Representative Tom Cole
and Ellen Cole

Representative Susan Davis
and Steve Davis

Senator Judd Gregg
and Kathleen Gregg

Representative Maurice Hinchey
and Allison Lee

Representative Rush Holt
and Margaret Lancefield

Senator Richard Lugar
and Charlene Lugar

Representative David Obey
and Joan Obey

Representative Major Owens
and Maria Owens

Representative Ed Pastor
and Verma Pastor

Representative Henry Waxman
and Janet Waxman

Scholars/Experts

Donald Deshler
University of Kansas

Thomas Fallace
University of Mary Washington

Daniel Fallon
Carnegie Corporation of New York

Johann Neem
Western Washington University

Melissa Roderick
University of Chicago

Robert Sexton
Prichard Committee for Academic Excellence

William Thomas
University of Nebraska

Uri Treisman
University of Texas

Stephanie van Hoover
University of Virginia

Constancia Warren
Carnegie Corporation of New York

Observers

Alison Bernstein
The Ford Foundation

Neil Grabois
Carnegie Corporation of New York

Adele Simmons
Congressional Program Advisory Committee
The Challenge of High School Reform

CONFERENCE AGENDA

Montego Bay, Jamaica
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High Achieving High Schools: Transforming Kentucky’s High Schools
Robert Sexton
Prichard Committee for Academic Excellence

In 2005, the Prichard Committee for Academic Excellence, a leading nonprofit group involved in Kentucky’s education reform efforts, released a highly regarded report calling for dramatic change in the state’s high schools. Dr. Sexton, who chairs this committee, will discuss the context for the report, its recommendations, and initial steps toward implementation.

Increasing Graduation Rates and Graduation Standards at the Same Time
Melissa Roderick, Chicago Consortium for School Research
University of Chicago

The Chicago Consortium for School Research has identified critical patterns in student progress in high schools, as well as leaks in the educational pipeline. Dr. Roderick will discuss the findings of these studies and what they suggest are useful points of intervention in supporting struggling students, reducing the number of dropouts, and preparing students to achieve high standards.

Building a Strong Literacy Foundation for High School Excellence
Donald Deshler
Center for Research on Learning, University of Kansas

Dr. Deshler will summarize existing knowledge about the literacy challenges adolescents face in secondary schools and discuss promising research and practice that could inform future directions to this emerging field and close the large achievement gap in many high schools.
Balancing Content and Pedagogy in the Preparation of High School Teachers
Thomas Fallace, University of Mary Washington
Johann Neem, Western Washington University

In this session scholars will describe a new course developed for prospective high school teachers of American history at the University of Virginia, which blends expert knowledge of factual content with pedagogical understanding. The course uses the reasoning and technique of professional historians to transform academic content knowledge into teachable subject matter for the 16 year olds who will be taught by these prospective teachers.

Emerging Strategies for Strengthening Mathematics Education
Uri Treisman, Director, Dana Center, University of Texas

No Child Left Behind has profoundly affected the priorities of state education agencies and local school districts as well as the core strategies they are adopting for improving student performance. The result has been a burst of local policy innovation and the emergence of promising new approaches to strengthening the teaching and learning of mathematics. We’ll look at the most effective state and district responses to education accountability legislation as measured by the National Assessment of Educational Progress (NAEP) with an eye to better focusing federal policy making on what appear to be the most powerful levers for constructive change.