The Three Generations of Effective Schools Research

By William L. Johnson, Ed.D., Annabel M. Johnson, Ph.D., & Jared W. Johnson, B.S.

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One of the greatest challenges facing American education today is closing the student-achievement divide. Many schools continue to struggle with low student achievement and low test scores, and there is little learning happening. Reform efforts may be new textbooks, changes in administrative duties, linking teacher evaluations to test scores, funding charter schools, or contracting the operation of public schools to privatized management. So far, this seems to be the best we can do. But this article will show what will really work to increase achievement for all students and close the student achievement divide. We will begin in 1966 with the controversial Equality of Educational Opportunity "Coleman Report."

Determinants of Effective Schools

In the mid-1960s, James Coleman headed a team of researchers looking for ways to maximize students' educational achievement (Coleman, *et al*., 1966). Over a two-year period, his team of researchers obtained data from over 4,000 schools, 60,000 teachers, and 570,000 students. Their findings showed no particular school characteristic had a measurable positive impact on student achievement. The only characteristic that showed a consistent relationship to student achievement was social class, today referred to as socioeconomic status (SES). The Coleman Report concluded however that family background, not the school, was the major determinant of student achievement. Furthermore, Stephens (1967) and Jencks (1972) reanalyzed many variables in the report and also found no variables that had any identifiable relationship to school achievement. As expected, the Coleman report stimulated a vigorous reaction, instigating a great concern for educational techniques (strategies) that would bring about changes in student achievement and defy the conclusions of the Coleman Report.

Ronald Edmonds, then Director of the Center for Urban Studies at Harvard, refused to accept the Coleman

Report as conclusive since he had found schools nationwide where poor (minority) students were achieving. Edmonds cited research (1979, pp. 17-19) showing that schools achieving above the norm had greater principal support, were more task oriented, provided more student monitoring, maintained classroom discipline, rated district administrators higher on support services than "un-achieving" schools, divided classes into fewer groups for purposes of instruction, and had teachers who were more satisfied with their work than teachers in lower achieving schools. He concluded that all students were "eminently educable," and the school was critical in determining the quality of students' education. His key principles (conditions or correlates) of student success were strong administrative leadership, high student expectations, and a supportive school climate.

The First and Second Generation Correlates of Effective Schools

Edmonds' (1979) pioneering description of the "correlates" set the standard and launched the first generation effective schools movement in the United States. However, since his initial description of the "correlates," the effective schools characteristics have been deepened and broadened into the second generation of effective schools (Lezotte, 1991): instructional leadership, clear and focused mission, safe and orderly school environment, climate of high expectations, frequent monitoring of student progress, positive home-school relations, student time on task, and opportunity to learn. The original focus on the curriculum has been expanded to include higher-order thinking skills and problem-solving abilities. The first generation set the standard, and the second generation provided a larger view of what schools needed to do to educate all their students. Following is a more detailed summary of both the first-and-second generation correlates.

Shared Vision and Purpose -- In the first-generation correlates, it was noted that effective schools had a clearly stated and focused school vision, including the school's curricular and instructional goals and priorities. While the first-generation correlates focused on teaching students, the second-generation correlates focused on learning for everyone in the school.

A Safe and Orderly Environment -- The first-generation correlates focused on a school climate that was free from physical harm and was not oppressive in teaching and learning. For the second generation, learning for all implied a positive, cooperative, collaborative learning environment for both students and adults.

Instructional Leadership -- In the first generation, the principal managed the school's instructional program in addition to the daily management duties. In the second generation, top-down bureaucratic management was replaced by bottom-up leadership that was driven by a vision of success and encouraged shared decision making. The instructional leadership role of the principal and the administrative staff would be broadened to include all the campus staff. All teachers would become instructional leaders. Districts could also employ curriculum specialists to help teachers in various departments. In the principal's instructional leadership role, the distinguishing characteristics would be a set of attitudes and beliefs (symbolic aspects of leadership) rather than just a set of skills and behaviors.

High Expectations for Students -- In the first-generation correlates, all students were expected to master the essential academic skills. In the second generation, the expectations were broadened significantly to implement additional teaching strategies to ensure that all students achieved academic mastery.

Student Time on Task -- In the first generation, a large amount of class time was devoted to instruction in essential skills and content mastery. With state testing and federal legislation, teachers would be expected to spend more time prioritizing curriculum content.

Monitoring Student Progress - - In the first generation, a variety of assessments were used to improve both student performance and the instructional program. In the second generation, there would be a greater emphasis on curriculum alignment and the use of technology to monitor student progress. There would be a greater use of curriculum-based, criterion-referenced measures of student progress and less use of standardized norm-referenced tests. There would also be the implementation of comprehensive,

customizable, and user-friendly systemic curriculum management systems built on the most current research-based practices.

Positive Home-School Relations -- In the first-generation correlates, parents were reluctantly brought into the school to help the school achieve its mission. In the second-generation correlates, there would be a genuine effort to establish authentic partnerships between the home and the school. Team building, trust, and communications were critical in establishing authentic partnerships.

Districts would begin the school-improvement process by conducting surveys, collecting data, and asking the following questions: what is our vision/mission; what are our district goals; who are our customers; what do our customers value; what have been the results of our previous endeavors; and what is our plan for addressing our school-and-student needs. Setting measurable school goals and devising plans to accomplish those goals would likely be the most positive and the most difficult tasks schools will face. The authors have also found that the implementation of the correlates is supported by a school work culture production (systemic) model linked to four interdependent components: planning, professional development, program development, and school assessment. These components have provided a foundation for more fundamental statements about implementing the first-and-second correlates. We refer to these components as elements of school work culture.

Planning - - School administrators and faculty together transform common concerns into specific goals. Strategic planning determines what schools should do. Planning tasks include setting goals that relate to primary outcomes and visions for the school. Tasks are dispersed to permanent and ad hoc work groups. Individuals are held accountable for their contributions within multiple small work units. Researchers have found that the intensity of commitment to organizational goals is the chief difference between great and not-so-great organizations. Performance improves most when specific, measurable goals are established.

Professional Development – Development plans that are linked to organizational goals have the power to enhance individual and group performance. Work groups become learning centers as school administrators and teachers share, plan, act, critique programs and coach one another. Collaborative quality-control systems are replacing outdated monitoring (watch-dog) systems and provide a regular group reflection, data analysis and problem solving as the school works on its plans.

Program Development – Program development plans that are linked to organizational goals help schools address challenges by coordinating program development, implementation and evaluation activities. Solutions to learning problems are apparent when school leaders facilitate problem solving and development activities and generate the necessary resources. It is documented that high levels of individual involvement facilitate success. Program management is understood to be the integrated management of specific programs on a systems basis. It could include instructional program and resources development.

School Assessment – Accountability systems drive assessment (appraisal) activity in productive schools. The assessment system that appears to have the greatest power to alter individual and school performance is a performance-based system. An overall assessment program may include data collection and analysis pertaining to student and campus performance, school climate, parental involvement, professional development, special programs and any other areas pertinent to the campus. Data analysis determines and prioritizes campus needs. Assessment data in productive schools provide a feedback and feed-forward loop that influences both short-and-long-range planning. Not unexpectedly, productive schools have complex assessment systems that measure the success of their goals. Productivity assessment would include assessing achievement for students, teachers, work groups and the school itself.

The authors have found that most schools focused on some of the four components; however, only the most productive focused on all four areas. A failure to focus on any of these areas significantly weakened the school. For example, is the school utilizing defined production strategies? Is the school conducting meaningful

assessment, and is the school committed to data-driven decisions that include students, teachers, and school partners? Does the school have strategies to unleash student-learning potential, or is everyone merely doing the "same old thing"? In consulting activities over the past several years and serving on accreditation teams, we have asked school administrators to provide copies of their vision statements, as well as their planning, development, and assessment documents. Interestingly, many school districts had no such documents. The message such sent was undeniable. Furthermore, in our studies in the U.S. and Canada, we have found that assessment has been the weakest area overall.

The first – and -second generation correlations certainly affirm that administrators and teachers together must assume responsibility for school excellence. Resources, information, opportunity and support are vital materials and forms of power within schools, and these forms of power fuel school production. As this discussion has noted, many districts currently use the effective schools research to manage their schools. This is certainly not a criticism. For most districts, however, school processes are linked to student achievement. It's obvious that state test scores have real implications for teacher bonuses and personnel decisions. This leads to our next discussion.

As powerful as the first-and-second generation correlates have been, there have been some criticisms. Thomas and Bainbridge (2001) posited that the correlates presumed all children could learn the same curriculum at the same level. However, not all children have had sufficient nutrition, stimulating homes and extensive learning opportunities before entering school. They also noted the fallacy of the principal as instructional leader of the school and posited that instructional leadership was the responsibility of the teachers. Principals may be a leader, but they have more than enough to do without taking over responsibilities that belong to teachers. It also seems fair to note the failure of the principal or assistant principal being both the teachers' evaluator and instructional leader. This arrangement has not worked in school supervision. Holland and Garman (1997) also identified a "crisis of legitimacy" in instructional

supervision arising from confusion about whether the source for legitimacy lay in instructional supervision being a professional practice for improvement of instruction or a legally mandated practice for evaluation of teaching. Thomas and Bainbridge further noted the fallacy of setting standards by exception. This means the exceptions were used to tell the world that all children could pull themselves up by their bootstraps and be successful in school. Furthermore, there are not uniform academic standards for all school students. Thomas and Bainbridge stated the logic that children and schools should be evaluated by a uniform criterion (usually a test score) was ignorance at best. Finally, there was the fallacy of telling teachers to work smarter and not harder. This seemed to imply that teachers were not too bright, and they must accept what fads came along: teacher-proof books, non-tolerance policies, and transactional leadership. With the desire for all students to succeed in school and the focus on state-driven assessment, another major area of concern in student instruction has been how to quantify the effects of the first-and-second generation research on academic achievement. We refer to this next era of research as the third generation of effective schools. This is our next discussion.

The Third Generation Effect Sizes of Effective Schools

The third generation effects have provided a way to quantify the impact of research-based educational strategies using effect sizes (Z-scores of a standard normal distribution) and meta-analysis (the weighted mean estimate of the effect size of several studies combined). These two methods have provided a methodology that researchers can use to report the results of continuous and sustainable school improvement, and teachers can check effect sizes as they consider educational strategies they might use in their classroom teaching. John Hattie, professor and director of the Melbourne Education Research Institute at the University of Melbourne, Australia, has been credited for bringing this new era of school reform and educational research to classroom teachers. By utilizing the standard effect size difference method between schools' experimental and control groups, he has set down what is considered the most popular method for calculating effect sizes. Researchers have used other methods to calculate effect sizes: the Pearson correlation

coefficient (r), the multiple correlation coefficient (R), analysis of covariance (ANCOVA), and the percent of variation (PV); however, Hattie has popularized the use of the Z-score form with a mean of zero and a standard deviation of one. For a particular educational intervention or strategy to be considered worthwhile, it should show an improvement in student learning of at least an effect size (Z-score form) of +0.40. This represents advancing student achievement by one year or improving the rate of learning by 15 percent (Hattie, 2012, p. 13). Hattie's first book, *Visible Learning* (2009) presented research into what has actually worked in schools to improve learning. His recent second book, *Visible Learning for Teachers* (2012), explained how to apply the principles of *Visible Learning* to classrooms. His book represented 15 years' research of more than 50,000 studies and 240 million students. This was the largest study of education in the history of the world (Johnson & Johnson, 2016). Hattie's latest research was updated in late 2016. His influences on achievement were increased from 150 to 194, but his findings were very similar to his 2012 findings (Killian, 2016). We will next look at Hattie's (2012) major influences (effects) on school achievement since his research findings have changed significantly since 2003.

Widening the Research Lens for Student Achievement

In 2003, Hattie synthesized the findings of half a million studies to identify the six major effects on student achievement: student (50%), home (5-10%), school/principals (5-10%), teacher (30%), and peers (5-10%). In his 2012 book (p. 14), he reported the additional findings of 60,000+ studies and 88,000,000+ students: student (15%), home (12%), school (9%), teacher (18%), curricula (17%), and teaching (17%). The student effect decreased from 50% in 2003 to 15% in 2012, and the teacher effect changed from 30% in 2003 to 18% in 2012. These are significant changes that impact how we view schools and teaching. To confirm these effect sizes did represent one year's student achievement, we calculated a weighted mean estimate of Hattie's data (2012, p. 14). Our meta-analysis value of +0.395 confirmed the +0.40 population effect size.

Desiring to better understand the structure of Hattie's (2012, p.14) six major contributions to learning,

the authors conducted first a principal axes factor (PAF) analysis then a principal components analysis (PCA). These are both statistical procedures used to examine the correlations between variables and generate a factor structure based on those relationships. Principal components analysis is the default method commonly used in statistical packages and is used with considerable frequency when exploratory factor analyses (EFAs) are performed (Fabrigar, et al., 1999; Russell, 2002; & Thompson, 2004). The only difference between the two methods is that one's (1.0's) are used in the diagonal of the correlation matrix in PCA analysis. But in PAF factoring, the communality estimates on the diagonal of the correlation matrix are iteratively estimated until the iterations converge (Thompson, 2004, p. 53).

We next considered factor rotations. This involves moving the factor axes of variables in a factor space so that the clarity of the underlying constructs becomes more obvious (Thompson, 2004, p. 38). We began with oblique rotations followed by orthogonal rotations. We decided to conduct a PCA analysis with varimax rotation (Kaiser, 1958) using Hattie's (2012) published data (Table 2.1, p. 14 and Appendix B, pp. 212-265). We made the decision for several reasons. With Hattie's research base of 88,000,000 plus, we had his six major effect size contributions to student learning (Hattie, 2012, p. 14): student (0.39); home (0.31); school (0.23); teacher (0.47); curriculum (0.45); and teaching (0.43). These effect sizes were exactly equivalent to Z-scores on a standard normal distribution. Since we were using variables' Z-scores in the analysis, we our called our solutions "super Z-scores." We were interested in a method to "boil down" the Z-scores into a smaller set of composite variables (Hogarty, et al., 2005). PCA was our first consideration since we were interested in a linear transformation of a set of correlated variables into a smaller group of uncorrelated variables. Also, since PCA analysis accounted for more variance than PAF factor analysis, PCA was also a consideration. Thompson (2009, p. 42) noted in about 85% of his exploratory factor analysis that varimax yielded simple structure. Furthermore, after we performed an initial PAF factor extraction with direct oblimin rotation, we examined the factor correlations provided as part of the oblique rotation output. Since the computed factor

correlations were less than 0.1, we determined an orthogonal rotation was more appropriate than an oblique rotation. See Meyers, Gamst, and Guarino (2006, p. 502) for a discussion of these decision choices. Thus, we conducted a PCA analysis with varimax rotation. The rotated factor component matrix values were as follows: student (.965); home (.934); school (.911); teacher (-.837); curriculum (.988); and teaching (.540).

Our analysis found three macro (composite) components. The number of components was confirmed by both a scree test (Cattell, 1966) and parallel analysis (Horn, 1965). The student (15%) and home (12%) combined to account for 32% of the total student achievement variance. The teacher (18%), curricula (17%), and teaching (17%) combined to account for 33% of the total variance, and the school accounted for 19%. The total variance accounted for was over 80%. This analysis showed that teachers (teacher, curricula, and teaching) were the major contributor to student learning. These composite results have provided a much broader context for understanding and applying Hattie's 2012 research findings. This is our next discussion.

Implications for Student Achievement

The Race to the Top Education program was funded by the American Recovery and Reinvestment Act of 2009. The program aimed to support improvements in teaching and learning that would lead to improved student outcomes. But in December 2016, the government released a research report indicating the $7 billion program had made no difference in student achievement. The report came as no surprise. We had predicted as much and knew the program would likely fail because it essentially ignored the realities of the massive shifting student population in the United States. In fact, more than half of our students in the public schools now come from families of poverty. Most of the students from poverty are wonderful young people. But many have low reading and math levels, struggle to pass, and are two-to-three years behind academically. Their lives are about relationships, and at its most fundamental level school itself is all about social relationships. To help these students, we should begin by developing relationships: immediately learning all their names, calling the roll daily so students can learn other students' names, greeting students at the

classroom door between classes, and looking for what we have in common with our students. If some are athletes and you played athletics in school, begin there. They all like cars, so "chat" about automobiles. We should next develop student-centered teaching.

Cornelius-White (2007) conducted one of the more important meta-analyses on student-centered teaching. The study sampled 355,325 students, 14,851 teachers, and 2,439 schools. Overall, the effect size was +0.64 (+1.6 year gain) between person-centered teacher variables and student cognitive outcomes, and +0.70 (+ 1.75 year gain) with affective or behavioral student outcomes. The essence of the student-centered teacher was warmth, trust, empathy, and positive relationships. The essence of positive relationships was the student seeing the warmth, feeling the encouragement and the teacher's high expectations, and knowing the teacher understood (Hattie, 2012, p. 158). Student-centered teaching will anchor accelerated learning and help close the student-achievement divide. We next grouped Hattie's 150 influences on achievement (2012, Appendix C, pp. 266-268) topically by his six major contributors to learning (Table 2.1, p. 14 & Appendix B, pp. 212-265). In Hattie's Appendix C, the 150 effect sizes are listed from high-to-low (ES +1.44 to -0.34), but grouping the effect sizes across his six dimensions of learning has made the influences more interpretable and less fragmented.

In Hattie's 150 influences on achievement (2012, Appendix C), there were 69 influences (46%) with effect sizes above +0.40 (the expected 15% academic gain for one year of schooling). For the underachieving students, it is critical that we choose those strategies with high effect sizes (greater than +0.40). Otherwise, many of these students may never catch up academically, never pass the state STAAR tests, and never graduate. However, we should not simplistically relate adjectives to the size of all effects. For example, Hattie (2012, pp. 13-14) noted a small effect requiring few resources might be more important than a larger effect size requiring high levels of resources. The effect size of reducing class size for 25-30 students to 15-20 students was (ES +0.22, +9%). But the effect size of teaching test-taking strategies was about (ES +0.27, +11%) in achievement and a +0.7 year gain in achievement. Next, let's briefly consider state testing.

State Testing and Student Achievement

The current failing level on STAAR tests, "Did Not Meet," is a score below 39% with only a few juniors and some seniors at 35% or 37%. The minimum passing standard for graduation, "Approaches Grade Level," is in the score range 39-to-60%. The next highest passing level, "Meets Grade Level," is in the score range 61-to-82%. Each of these last two levels has a 21% range and is equivalent to 1.4 years of academic growth. The highest level of achievement, "Masters Grade Level," is a score greater than or equal to 83%. A 1.4 year gain will move a student from failing to passing or advance a student one level on the STAAR test (+21%). It seems interesting that Hattie (2012, p. 266) found the expected student achievement from one year of direct instruction was (ES +0.59). With the new accountability system, one needs to look not only at how many students passed but how many students reached each level of achievement. As far as school accountability is concerned, it is as equally important to move a student from "Did Not Meet" to "Approaches" as it is to move a student from "Meets" to "Masters." In short, all students matter. Schools should compare their students' scores to their regional scores by referring to their Regional Service Center's Facebook and Twitter pages. Developing student expectations will increase student achievement over three years. Short assessments (ES +1.84) will advance student achievement more than four years. The notion of rapid formative assessment (assessments conducted between two-to-five times a week) is very powerful as a form of feedback. Yeh (2011) compared the cost-effectiveness of 22 approaches to learning and found rapid formative assessment was the most cost-effective compared to all the following: comprehensive school reform, cross-age tutoring, increases in teacher education, teacher experience, teacher salaries, summer school, more rigorous math classes, value-added teacher assessment, class size reduction, a ten percent increase in per pupil expenditure, full-day kindergarten, Head Start (preschool), high-standards exit exams, National Board for Professional Teaching Standards (NBPTS) certification, higher teacher licensure test scores, high-quality preschool, an additional school year, voucher programs, or charter schools.

Set academic priorities, and don't focus on the 81 low-impact strategies with effect sizes below +0.40. Following are some examples: web-based learning (+0.18), charter schools (+0.20), special college programs

(+0.18), matching learning styles (+0.17), and television (-0.18). Teacher subject matter knowledge (ES +0.09, +4%), was number 136 on Hattie's list of influences and among the smallest of all his 150 influences on achievement. The distinction was less about pedagogic content knowledge but more about how teachers organized and used content knowledge and how they taught based on their students' needs and their own teacher goals. The great teachers also maintained a passionate belief that all students could learn. Students will meet whatever expectations the teacher has, so stop overemphasizing ability and emphasize effort and progress. Begin with what the students know and can do. Hattie's research (2012, p. 267) also showed that SES ranked number 45 on his list of 150 effect sizes. In other words, there are 44 other influences with a greater influence on student achievement than SES. Schools cannot continue to blame students' home life, SES, or motivation as an excuse for poor student progress.

Summary and Conclusion

This presentation showed that Edmonds' original research (1979) had a significant positive effect on education in the United States. In fact, he singly started an educational revolution and showed students of poverty were educable. Our presentation reviewed issues about student achievement and noted the importance of studying Hattie's high-impact student-achievement influences with effect sizes greater than +0.40. We also presented a research-based, defensible change model and how everyone in the public schools should be thinking in new powerful ways about student achievement. The large within-school variance also highlights the variance provided by teacher effects and teachers using high-impact strategies to close the student-achievement divide. The A-F school ratings are here, and so are the greater attempts to privatize the public schools. Greater web-based learning is coming, and global technology seems to be shifting education to a dual system focusing largely on "functional literacy." The robotics revolution is here, but neither the universities nor the public schools know its ultimate impact on public education. If the public school system is to survive as we know it today, the content of this presentation should be considered by the administrators and teachers in every school district in the United States.

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