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## Long Island Education Review

## LONG ISLAND'S PEER-REVIEWED RESEARCH JOURNAL FOR EDUCATIONAL PROFESSIONALS

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Long Island Education Review is a peer reviewed publication that is published twice each year. To be considered for publication, all submissions should be double spaced, in 12 point characters and accompanied by a disk in Word, or they should be sent by email as a Word document. Authors should follow the APA guidelines. No article will be accepted if it is more than 10 pages (double spaced) long. Suggested changes are the responsibility of the author. For the Spring issue, all submissions must arrive by March 15, 2013.

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## Editor's Perspective

Foremost, I would like to thank the SCOPE Board for having the confidence to appoint me as the new Editor-in-Chief of the Long Island Education Review. I served on the Editorial Board of the journal since its inception in the Fall of 2000. Before I suggest expanding our approach, I would like to introduce myself and possibly give you some insights into who I am and why I have taken over as Editor-in-Chief.

I have been employed in the field of education for over 42 years, specifically, in the field of Special Education. My experiences have included teaching High School Special Education and teaching in an experimental educational program for severely disabled students with the University of Washington. I have been Director of Services for United Cerebral Palsy in Maryland. I served as Director of Special Education and coordinator of services for students with severe disabilities for the State of Alaska. Most recently, over the past 27 years I have taught Special Education at the college level. As you can see, I have dedicated my professional life to the field of education. Which now leads me to explain why I have decided to become the next Editor-In-Chief.

The explanation is simple. Golf. Drs. Bob Manley and Kevin McGuire got me on the golf course and popped the question. Afraid of losing my golfing partners, I had no choice but to say yes. I know with their assistance and guidance, we will be able to continue to publish an excellent and worthwhile product for Long Island educators, as well as State and National audiences.

The L.I. Education Review has a rich history of research, which I propose to expand in two ways: readership and content. At the first board meeting my suggestion was to seek ERIC acceptance. ERIC is the leading archive for educational research and resources, and joining will increase our readership circulation and notoriety as a review journal. With increased access through ERIC our research can expand in content. Research has always interested me. It can take on many forms and can serve many purposes. Having taught Introduction to Research and Research Application for over 20 years, I always look for the merit and practicality in research. The two questions I always ask are simply; "So What" and "Is it useful?" With this in mind, I would like to suggest that we as members of the Board not only seek out research articles, but also include examples of research in Best Practices. Today's research in Best Practices has an important impact on our districts and classrooms. We as research educators not only need to identify those elements that are considered Best Practices, but explain how they work and identify the procedural practices that work. I have always said to my students, if you read the methodology section of a research article and you can't duplicate it in your classroom, there is something wrong with the research. It is therefore my suggestion that we expand the L.I. Education Review to include a section for Best Practices with an expanded audience through ERIC. I hope our readers share my enthusiasm in this worthy endeavor and will contribute to the future of the Long Island Education Review.

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Richard 1. Swanby
Editor-in-Chief
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## Opinion Center

## Money Is Not The Problem.

It never was the problem, and it's not the problem now.

## Remedial Education Programs: <br> The Structural Cause of Fifty Years of Failure, But We Can Close the Achievement Gap

Since the 1960's and the education legislation of the "Great Society" literally hundreds of billions of federal dollars have been spent on remedial education. Each year has seen huge increases in funding. Many additional billions have been expended for remediation by states and local school districts on their own home grown remedial programs.

As a college teacher and K-12 educational trainer for more than forty years I have asked literally thousands of practicing educators the following questions.

1) How many of you believe that the federal Title 1 remedial reading and mathematics programs have brought real improvement in student achievement?
2) How many of you think these programs have had significant benefit in closing the achievement gap?

The answer to both questions is virtually none. We also know that nationally student achievement scores have not changed. These results reflect what is common knowledge among educators across the country. Chapter I/Title I and other remedial programs do not work. In spite of this futile effort, we have increased funding nationally each year. Hundreds of billions have been and continue to be wasted.

In addition to spending hundreds of billions of dollars, the Title I remedial program has involved tens of thousands of teachers and tens of millions of children. It has been a herculean effort to improve students' basic skills to put it mildly. Why it has failed should be a primary concern to educators, to say nothing of taxpayers and politicians. It is precisely such massive and ineffective use of resources that is failing our students and destroying support for public education.

I was a participant on a New York State Education Department team sent to review a Title I remedial reading program in a New York City school where reading test scores for Title I students had gone down for three years in a row.

The large urban school had seven full time Title I remedial reading teachers. I spent a full period observing the classes of each teacher. (I should note that I taught reading for ten years, supervised it for many more and have an advanced sixth year graduate degree in it. I felt quite comfortable observing Title I remedial reading classes.) To my surprise, everything that I saw ranged from very good to excellent. Not one of these Title I teachers was doing a poor job of instruction. On the contrary, I believe that Title I teachers as a group may be among the best teachers we have. They do a lot of tutoring, one on one instruction, which is the best way to learn to teach.

This left me baffled. Here was a school with seven full time Title I remedial reading teachers. Every one of them was unusually effective. And yet the reading scores of their students had declined for three years in a row. How could this be?

Given the special "extra" help, why do these remedial students continue to fail? The typical response to the failure of Title I and other remedial programs is a call for more money, more Title I teachers, more of this, more of that, more of the same. That has not and will not work.
W. Edwards Deming has the solution. Deming observed that $95 \%$ of the chronic problems in organizations are structural or systemic. They are not coming from the workers (in this case the students and teachers) but how the work is structured or organized. When we examine the Title I remedial reading program closely, we find an obvious structural flaw that makes this and all other remedial programs ineffective no matter how hard or effectively the teachers work.

Title I was created to help students who fall far behind in their work in regular classes, especially in reading and/or math. The program design called for these students who could not function in their regular classroom program to receive 90 minutes per week in small Title I classes with specially trained teachers. These classes were/are specifically designed to meet the needs of these students.

This sounds good at first. But extend the picture. Title I students spend 90 minutes, or $11 / 2$ hours per week succeeding in a program designed to meet their needs. What happens to them the other $331 / 2$ hours remaining each week in school? They are returned to a regular classroom program that frustrates them, a program that they cannot understand. That is the reason they were pulled out of it to begin with.

Some simple math reveals the remedial program structural flaw.
$11 / 2$ hours $=4 \%$ of student time per week in a helpful program.
$331 / 2$ hours $=96 \%$ of student time per week in a frustrating, defeating program.

Thus while the $11 / 2$ hours weekly may be highly effective time for these students, $96 \%$ of their regular classroom ineffective time is unchanged, still unproductive, frustrating and defeating.

Given this structural flaw, it is not at all surprising that Title I has failed to improve student achievement or closed the achievement gap. We could double the current funding and spend hundreds of billions more. The current structure will yield the same results. The structure of the work limits the capacity of the workers (teachers and students) to produce.

It is true that some time ago Title I finally changed the rules to "permit" whole school improvement if schools satisfy certain bureaucratic "requirements." In fact little has changed. The overwhelming amount of Title I funds is still allocated to improving 4\% of the students' educational time while ignoring $96 \%$ of the time spent in the ineffective regular classroom program. It should be noted that all other remedial programs have similar time structure flaws.

One attempt to fix the problem was to move away from "pull out programs" to "push in programs." Instead of pulling failing students out of regular classrooms many Title I teachers work in the regular class with the classroom teacher. While this is a very small step in the right direction, it is hardly a move that has had a major impact. Achievement scores have not improved.

This is a clear example of how government bureaucrats, however well intentioned, designed and funded a massive remedial program that could not work. Failure is built into the program structure. That failing program as of 2012 is 46 years old.

There is a way we can improve the reading achievement of students who are way behind and close the achievement gap. W. Edwards Deming tells us to Improve constantly and forever the system of production (In this case the regular classroom reading program.)

The answer is as obvious as the problem is conceptually simple. Title I should require all schools involved in the program to do whole school reading program improvement. Unless we improve $100 \%$ (or as close as possible) of students' reading learning time, Title I and other remedial efforts will continue to produce the same dismal results. It is the regular developmental reading program that is failing to meet student needs every day in school that must be improved, not a tiny fraction of the students' reading program.

The good news is that a tiny percent of remedial funds could, if properly utilized, accomplish whole school improvement. The bad news is that federal and state regulators, abetted in many cases by local Title I administrators, are still acting out of habits and patterns of the original Title I program and continue to fail to make changes needed. Beyond that, the people who run the program at all levels, for the most part, do not yet understand the structural problem, much less the obvious solution.

The structural answer to the question of whether Title I can be successful is absolutely "yes." "How" requires reconceiving and restructuring the regular classroom reading program to meet the needs of all students $100 \%$ of the time. Of course the same is true for mathematics. This must be done soon before the public and politicians eliminate it completely. After more than five decades, time and patience are quickly running out.

First, we must abandon the absurd idea that improving $4 \%$ of a student's time in school while he remains frustrated and defeated $96 \%$ of the time will help.

Second, we must use Title I resources to leverage the much greater resources being expended on the $96 \%$ failure time. Each school must periodically assess its reading program needs and improve itself accordingly. At least a portion of Title I funds should be allocated to the school principal and planning team for whole school improvement. I believe all of Title I funds should be so allocated. While this may still be politically impossible, even 5 to $10 \%$, appropriately used, could bring massive improvement. One thing is certain; business as usual is going to put Title I and quite possibly all of public education out of business.

In addition to Title I remedial programs there are many other remedial programs that are structured with the same time allocation flaw that have been set up by many states and local school systems. These add countless more wasted billions to the federal, state and local expenditures. Only improving the whole school regular reading classroom and mathematics programs will do. Title I can, if appropriately utilized to improve the regular school reading and mathematics programs (as opposed to adding small band aids to gaping wounds), dramatically improve the entire school. If we improve language achievement all other achievement which is
contingent on language will improve as well. Language achievement is the lever for all other cognitive achievement.

Most importantly, we must stop using add on remedial programs to attempt to overcome the shortcomings of the regular classroom programs and find ways to improve the regular programs that make up $100 \%$ of student instructional time in school. The key to doing that is to build into the regular classroom programs the means to effectively deal with individual student differences.

In fact, we are also spending many more billions on other "band aid" programs such as gifted and talented and learning disabilities programs. Indeed, most of special education would be unnecessary if we adjust the regular program to meet the needs of all students. When the program does not meet the needs of the students, we must change the program to do so.

We are trying to improve the students and teachers when they are not the problem. We should be improving the entire instructional curriculum/program to function effectively $100 \%$ of the time for all students.

Remedial and other "special" programs exist only because of the inadequacy of the regular classroom program. When we make the changes to the regular instructional program necessary to include virtually all students, we will not only improve achievement dramatically but also reduce costs of those very expensive special programs.

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Thomas F. Kelly, Ph.D. is a Professor in the School of Education at Dowling College, Oakdale, NY. This article is from Dr. Kelly's latest book: We Can do More and Better With Less: Education Reform Can Work, from Infinity Publishing.

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Today's schools face many challenges. There is increased awareness of the need to prepare students to compete globally. Along with the challenge of remaining globally competitive is the awareness that trust in public education has declined and some would suggest that the United States has fallen behind other nations in preparing highly qualified students that are capable of competing in a global economy. Of course, in order for schools to deliver the best possible education it is necessary to adequately train and prepare highly qualified teachers.

Birman, Desimone, Porter, and Garet (2000) suggest that an emphasis on high quality professional development is absolutely necessary in order to improve the quality of education. Increased emphasis on accountability and student achievement requires schools to raise the level of expectations regarding teacher qualifications and training. In order for schools to be successful in achieving their goals it is necessary to adequately prepare a work force of teachers who are competent, efficacious, and capable of meeting the demands of preparing students to compete globally. However many new teachers enter the classroom with basic knowledge regarding teaching theory but limited ability to apply theory to practice and to meet the high demands placed on them in an educational setting that is focused on standards and accountability.

Not only are new teachers often ill prepared to meet the practical demands of teaching but according to Smith and Ingersoll (2004) as many as $50 \%$ of new teachers leave the profession in the first five years of teaching leading to a revolving door that can clearly have a direct effect on instruction and student achievement. Structured mentoring and induction programs that focus on building trusting relationships between mentors and new teachers can greatly improve the success of new teachers and the likelihood that new teachers will remain in the profession (Darling-Hammond, 2004; Martin, 2008; Smith \& Ingersoll, 2004).

## Why Focus on Mentoring?

Many states have begun to mandate mentoring programs as a way of inducting new teachers into the profession and addressing the problem of teacher attrition. However, the quality of the programs and the degree to
which these programs are structured varies from state to state and district to district. In fact the definition of what mentoring is has not been consistent. Some refer to mentoring simply as the pairing of novice teachers with a veteran teacher. However, Wong (2004) pointed out the ineffectiveness of such efforts. He suggested that in order for mentoring to be successful it must be a part of a comprehensive system wide program of induction. Such programs should include professional development and training for mentor and mentee, structured time for mentor and mentee to meet, carful pairing of mentors with new teachers, and on-going supervision.

## Why Do New Teachers Leave the Profession?

Dissatisfaction with the working environment, lack of administrative support, and inability to influence decisions regarding teaching and learning are often cited as reasons that new teachers leave the teaching profession (Martin, 2008). Other studies report that new teachers are more likely to leave the profession in large urban districts and schools that have a higher percentage of minority and low income students (DeAngelis \& Presley, 2010). However, some studies report that more effective teachers are less likely to leave the profession (Boyd et al., 2005) pointing to the importance of teacher efficacy which is a teacher's perception of her/his ability to execute expected instructional outcomes. Teachers who believe they are capable are more likely to persist in efforts to reach teaching goals and less likely to leave the profession (Goddard, Hoy, \& Hoy, 2004).

## Benefits of Mentoring

Research has shown that there are many benefits to establishing well designed mentoring programs. Several researchers point to lowered attrition rates among new teachers as being one of the primary results of mentoring programs (Darling-Hammond, 2004; Martin, 2008; Smith \& Ingersoll, 2004). Mentoring also assists new teachers in becoming reflective practitioners and developing the skills necessary to meet the needs of a diverse student body. Yost (2002) suggests that mentoring raises new teacher confidence and commitment to the profession. Ideally, mentoring also reduces the sense of alienation that many new teachers experience.

## The Importance of Trust between Mentor and Mentee

The importance of building trust between mentors and mentees has been alluded to by several researchers (Pavia et al., 2003; Ryan \& Hornbeck, 2004; Ferguson, 2006). However little is known about the specific components of mentoring programs that lead to increased trust or how such relationships benefit new teachers. We do know that trust is an essential element in all relationships that are considered important and has been shown to increase effectiveness, foster collaboration, enhance communication, and promote teacher efficacy (Bryk \& Schneider, 2002; Fisler \& Firestone, 2006; Forsyth, Barnes, \& Adams, 2006; Goddard, Hoy, \& Hoy, 2004; Hoy, Smith, \& Sweetland, 2003; Hoy \& Tschannen-Moran, 1999; Smith \& Ingersoll, 2004). In light of the important role that trust plays in facilitating effectiveness we suspected that the trust between new teachers and their mentors would be vital to the development of teaching efficacy. Prior studies have shown that teacher trust in the principal has been associated with increased teaching efficacy but no study to our knowledge has explored the effects of teacher trust in their mentor on increased teaching efficacy.

## The Current Study

To test our hypothesis we surveyed 128 first year teachers who were involved in formal comprehensive mentoring programs in 12 districts on Long Island. Three surveys formed the basis of our investigation. Teachers were asked to take a Teacher Trust in Mentor Scale (Mitchell, Celano, \& Tarter, 2008) developed for this study, a Teacher Efficacy Scale (Hoy \& Woolfolk, 1993), and a qualitative Mentor Trust Questionnaire (Celano, 2009), that explored specific aspects of the mentoring program that were associated with increased trust between mentor and mentee.

## Is There a Relationship between Trust and Teacher Efficacy?

Our findings indicated that trust between mentor and mentee was associated with increased personal teaching efficacy. Teachers who had a higher degree of trust in their mentor were more likely to have a greater sense of their ability to successfully meet instructional objectives.

## Key Factors Associated with High Levels of Trust between Mentor and Mentee

Additionally our findings confirmed the importance of a number of key factors that contributed to increased trust between mentor and mentee:

- Frequent contact between mentor and mentee
- Same subject knowledge of the mentor
- Release time to meet with mentors
- Designated time for mentors and beginning teachers to observe one another frequently
- District and school level support for the mentoring program in the form of training, professional development, and on-going supervision


## Implications for School Leaders

Trust between mentors and mentees is vital to the formation of teacher efficacy. New teachers who had established trusting relationships with their mentor were more likely to have an increased sense of confidence in their ability to effectively meet instructional challenges. Our findings confirmed the findings of Wong (2004) regarding key components of successful induction programs such as structured release time, same subject knowledge, frequent contact, ongoing support and professional development, but further points to the importance of these critical elements in increasing the level of trust between the mentor and the new teacher. It may well be that these elements are essential because they foster trusting relationships that work to increase new teacher confidence and efficacy. Teachers who believe that they are capable and competent to meet the needs of their students will persist in reaching students even in the face of challenges and adverse circumstances. While the current study did not explore this, we suspect that high levels of trust between mentors and new teachers may also help to reduce new teacher attrition.

Administrators and teachers who are charged with designing and monitoring teacher mentor programs should include design features that foster trust between mentors and new teachers. Careful selection of mentors who have same subject knowledge, structured time to meet with and observe mentees, and on-going training and professional development are critical components to successful teacher induction. Administrators and teacher leaders should abandon outdated practices of simply pairing new teachers with veteran teachers. New teacher attrition is costly and recent estimates place the cost of replacing new teachers who have left the profession at approximately $\$ 2.6$ billion annually (Martin, 2008).

Well designed teacher induction programs should include mentor training (Wong, 2004) Administrators cannot assume that experienced teachers know what it takes to be an effective mentor. Hughes and Taylor-Dunlop (2008) recommended that mentor training also include an agenda that practically identifies ways for mentors to nurture and build trusting relationships. Trust involves risk and in order for new teachers to risk sharing important details regarding their instructional concerns they must feel confident that their trust will not be violated and that the mentor will have their best interest at heart. Mentors have to exhibit open, honest, competent, reliable and benevolent behavior (Hoy \& Tschannen-Moran, 1999).

We also recommend that administrators consider using periodic assessments of trust between new teachers and mentors as well as assessments of teacher efficacy like the ones we used in this study. This can give essential information regarding whether mentor pairs are working and whether new teachers are developing a strong sense of personal teaching efficacy. Administrators set the tone for the school. An administration that encourages innovation, risk-taking, and trust is likely to create a culture in which new teachers thrive and induction programs are successful.

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## Current $A_{\text {pproaches to }} A_{\text {ssessment }}$ in $A_{\text {mexican }}$ Education: $A_{n}$ Overview and $A$ Case Study By Patrick B. Johnson, PhD., Richard Bernato, Ed.D., and Ellen Moore

This is the first of two articles to be written regarding the current state of assessment in American education. In this initial piece, we highlight some general approaches that have been made during the past decade, many of which occurred in response to federal No Child Left Behind (NCLB) legislation. In the second, we discuss the recent and ongoing changes that are currently occurring in New York State, many of which have occurred in response to Race to the Top funds recently awarded to the State by the federal government.

Since its implementation in 2002, No Child Left Behind (NCLB) has brought about a multitude of changes in schools at many different levels ranging from the state all the way down to teachers and parents. One of the four primary principles of NCLB is stronger accountability; another gives individual states and school districts more freedom in decision making. The combination of the stronger quantitative accountability and the freedom that school districts are now allowed seems to have everyone scrambling to figure out what they should be doing and how to get that job done.

Data collection is required to satisfy NCLB's quest for accountability. Schools have been given the leeway to choose how their data will be collected and analyzed. An important consequence of the focus on data has been the conceptual ascendancy of data-driven decision-making in the educational literature. Stated simply, schools in general and teachers in particular are supposed to utilize student data to assist them in making decisions about how best to enhance student achievement. What needs to be changed in our educational practices and what maintained?

In response, some schools are using existing systems while other schools are implementing new systems. Across the board, administrators and teachers agree that data collection is only the beginning. Research (Halverson, Frig, Pritchett, \& Thomas, 2007, p.163) has identified four steps to making decisions regarding data collection. First, schools and districts need to establish practices to collect, store, and communicate relevant data; second, schools need to establish goals; third, schools need to develop interventions designed to achieve their goals; and finally, schools must develop practices to learn from their interventions and to integrate what is learned into this cybernetic cycle.

In the current climate, it comes as no surprise that the Obama administration's efforts at school reform, characterized by its Race To The Top funding policies and priorities, are no less committed to using data as guideposts to evaluate student achievement and teacher, administrator, and program effectiveness. Authorized under the American Recovery and Reinvestment Act of 2009, the Obama administration provided $\$ 4.35$ billion dollars for its signature education program, Race to the Top. To procure funds, states have had to compete with one another to demonstrate their commitment to enhancing the educational outcomes of their students by creating the contexts for educational innovation and reform. The guidelines released by the Department of Education focused on four general areas, two of which dealt with assessment. The first of these concerned standards and assessments while the other concerned data systems that support effective instruction.

Here the expectation is that given that teachers and their principals will be evaluated on a formulaic basis that will incorporate their students' performance on standardized and school-based assessments and on teacher evaluation system formulas, such as Danielson's (2007) frameworks and New York State United Teachers frameworks, districts will need to identify and negotiate systems of measurement with their teacher and principal unions. This has been and will be an arduous process for all involved. In fact Governor Cuomo has declared the initial implementation efforts to be a failure and will be appointing a commission to generate more effective solutions.

The year, 2011, for example, marked the beginning of major revisions to New York State's Annual Professional Performance Review (APPR). Review of student performance behavior will serve as key variable in the formulas used to assess educators and will also play a role in their retention. Another component of the legislation will require that each school formulate and use Data teams to assess student performance and make recommendations on the programmatic and personnel levels to improve achievement.

While standards and assessments relate to the adoption of internationally benchmarked standards and assessments designed to prepare students for college success and beyond, data systems refer to the development of
longitudinal data systems that can assess student success and inform educators and administrators how best to improve their teaching practices through ongoing analyses of student data. Both NCLB and RTTT emphasize the importance of assessment and the need for insuring that the next generation of teachers is comfortable both with analyzing and with interpreting student data usually in the form of student test scores.

An obvious question that arises in this context is how best to enhance the assessment skills both of teachers (both pre- and in-service), and the administrators who supervise them. The better skilled that pre-service and inservice teachers become at using formative and summative data sources the more successful they will be at diagnosing and prescribing appropriate teaching strategies to remediate deficits and strengthen assets. Pre-service and in-service administrators too, must be trained in leading their data teams towards accurately identifying root cause issues at play, wrapping smart goals around sound vision, and systemically organizing resources and efforts towards students' achievement.

In addition, administrators must practice and master state education approved supervisory models that align with APPR requirements. These models, one notable example being Danielson's Frameworks for Teaching, accent teachers' use of data in planning and modifying instruction. Administrators' supervisory practices will be responsible for ensuring that teachers use data effectively. In addition future and present administrators will need particular skill sets to ensure the effectiveness of data teams. For if an administrator is unfamiliar with data gathering and analysis procedures, he/she cannot adequately select appropriate members for a district or school data team nor determine whether the team is functioning effectively.

We now turn to a description of some of the approaches currently employed by districts to enhance teacher and administrator assessment skills. We then proceed to describe some of the data systems and supports that have been developed to assist these groups on Long Island. The paper concludes with examples of innovative approaches to enhance teacher and administrator assessment that have been developed or are in the process of being developed to assist both teachers and administrators work effectively with these systems to improve students' academic success. A central goal of the present paper is to provide examples of the ways in which school districts, boards of cooperative educational services, and schools of education can work together to enhance assessment systems and assist teachers to better utilize these systems and, in so doing, enhance their students' educational outcomes.

## General Approaches to Assist Administrators and Teachers Handle Data

The first approach, instructional rounds, was developed by Elmore and his associates (City, Elmore, Fiarman \& Teitel, 2009) for use with superintendents to improve the
educational outcomes in low performing schools in Connecticut. In this approach, a network of superintendents is formed from which teams are selected to visit a school experiencing academic difficulties. The team moves from classroom to classroom filling in strict protocols describing the classroom activities observed. The visit culminates in a meeting with the principal in which another protocol is followed to present the cumulative results of the classroom visits.

Elmore adapted the idea of the protocol from medicine, where physicians tend to follow strict protocols when interviewing and diagnosing patients. From Elmore's perspective (2007), education would be better served if it too followed such protocols when trying to discern the source of a school's problems.

Protocols provide two advantages under these circumstances. First, they initially provide a structured framework from which to begin to examine the school and consider the possible difficulties. Such structure is often lacking in school evaluations that tend to follow the dictates of the observer and their own past experiences. This makes it difficult to compare evaluations across evaluators and to establish much uniformity in what is an extremely important and complex process.

The second advantage of protocols is that they depersonalize the evaluation process. As Elmore emphasizes, protocols also separate the person from the practice so that a team is not evaluating a particular classroom teacher or school principal. Instead the protocol enables the evaluation team to zero in on a particular classroom practice and then attempt to relate it to students' academic difficulties and deficits.

The idea of structuring school evaluation through the use of protocols would move the process toward a more scientific approach to assessment and data collection. In science, protocols are universally employed in specific scientific disciplines to insure comparability of measures and procedures. Their incorporation into instructional rounds is a promising approach that may help to move educational assessment toward greater consistency and comparability of results.

Data teams represent another approach that has taken on various forms when utilized in different districts throughout the country. The basic idea behind the creation of data teams is to bring together a group of individuals, often administrators and teachers within a school, who will take responsibility for facilitating the use of student data to identify areas of instruction that require remedial attention or to highlight areas where exceptional effectiveness can be noted and better understood. In most instances, a data expert, someone familiar with assessment and data analysis, will be included in the team.

While data teams fulfill many functions, a couple of key ones relate to identifying the types of data to be used and the approaches to be used in the analysis. With respect to
identifying data, data teams need to decide which assessments will be used. Will it be state tests, local assessments, and/or classroom assessments including tests and quizzes? With respect to analysis, will the assessments be used to identify individual students learning and growth over the course of some specified time period or will it be based on proficiency which sets a specific level of learning that each student should achieve?

Data teams, groups of educators brought together to utilize student data more effectively, should assist classroom teachers be better practitioners (Besser, Davis \& Peery, 2006). Furthermore, Reeves 2002 suggests that data teams should also help to create a data-friendly context by pinpointing students' academic needs and linking teachers to one another as collaborators in teaching rather than as isolated instructors.

Data teams may be drawn from a building or from a particular grade level. There could also be district-wide data teams that could be used in educational contexts like New York State where administrators are also going to be evaluated with reference to student data outcomes.

Administrators and teachers must consider several variables before attempting to develop data teams. As noted in the Japanese proverb, "None of us is as smart as all of us". It may also be true that a group's ability to execute its charge with respect to collection and management may suffer because the group lacks the requisite skills to be effective. Wohlstetter, Smyer, and Mohrman's (1994) work on high involvement school improvement appears to support this position.

Their comparison of schools deemed "effective" both in the United States and Australia appeared to isolate seven variables essential for an effective school improvement team. Four variables appear particularly germane to formulating effective data teams. These are leadership, knowledge, information (data), and goal-setting.

Leadership speaks to the authority that the data team has with regard to making recommendations about the conclusions it draws from student data. Goal-setting speaks to the quality of the goals they may set. Information or data speaks to the quality of the data considered and its comprehensiveness. Wohlstetter et al. characterized knowledge as the ability of the data team or school improvement team to engage and analyze data to synthesize appropriate conclusions and goals.

Moreover, it is essential for school data teams to work to relate student assessments to the interventions currently being applied in the district or school (Balfanz, 2011). All too often students are assessed without examining whether these interventions are achieving the goals they are designed to achieve. Often when students fail to achieve proficiency or manifest minimum growth, the lack of success is attributed to the student when it really results from an ineffective or poorly applied educational intervention.

As district or school personnel consider forming data teams, they need to ask themselves if they are actually ready to seriously "work" with data in a meaningful way (Boudett \& Steele, 2007). For example, is the principal committed to taking the role of data team participant and leader? Is the principal knowledgeable about data and data analytic techniques and the data systems extant in the school district? Has real time been allotted for teachers to work collaboratively on student data and to mine its meaning and significance? Has meaningful professional development training been provided? And, finally, should data indicate the need to enhance instruction in some academic area have resources been set aside for professional development in the area?

According to Steele and Boudett (2008), there are a series of steps that must be followed in setting up data teams. In sequence, they are: preparation for collaborative work, building assessments that are reliable and valid and administered with fidelity, creating a data overview regarding what is and is not available to the team, gaining familiarity with student data, examining classroom instruction vis-a-vis student data, developing an action plan to assess progress, and assessing outcomes.

Data teams also require a common set of standardized assessments that are linked to school or district curricular goals. Such assessments allow for comparability from year to year, grade to grade, and school to school and allow the data team to determine the extent to which progress is being made toward goal attainment. Ideally these assessments are stored in a longitudinal data storehouse. A number of reliable vendor platforms are available for districts, some house only local data while others house statewide data. It is critical to possess such warehouses if we are to accurately gauge students' growth over time.

Finally, data teams need to decide, possibly in conjunction with an outside data expert, appropriate norms for analysis. Statistical analyses can range from simple descriptive to highly complex inferential analytic techniques. Understanding what are necessary and appropriate analyses must be decided in advance as they will determine not only what types of analyses will be conducted, but what types of data will be required for different analyses. Certainly, most schools and even districts do not possess either the requisite psychometric or analytic expertise to address these issues. As a result, in the initial development of data teams, data experts from surrounding colleges and universities might act as consultants. In the absence of a clear understanding of what can and should be done with student data and how to evaluate data quality, the process of building data teams makes little sense and has little, if any chance of enhancing student achievement.

## Eastern Suffolk Board of Cooperative Educational Services (ESBOCES) Data Systems: A Case Study IIIustrating How the Assessment Landscape is Changing

As the emphasis on assessment increases and the use of student data for teacher evaluation becomes more widespread, districts and state systems that provide
support to them will become more involved in the business of data management and analysis. Despite complaints about the process and the amounts of time spent testing rather than teaching children, even the National Education Association, the largest union of teachers in the nation, recently voted that evidence of student learning needs be considered in evaluating teaching effectiveness (Otterman, 2011).

A great deal of attention was directed toward teacher evaluation in recent years by Michelle Rhee, former Chancellor of the Washington, D.C. school system, who made teacher evaluations a central tenet of her somewhat stormy tenure. It is not surprising, therefore, that the District of Columbia school system developed its own evaluation program. Named the DCPS Effectiveness Assessment System for School-Based Personnel, it includes a series of components that can be viewed at the following website: http:www.dc.gov/DCPS/IMPACT.

While this represents a new system that has only recently been put in place, other areas of the country have been experimenting with a series of other systems. In New York State, boards of cooperative educational services have been at the forefront on data assessment, storage, and analysis. The board in Eastern Suffolk County on Long Island has been deeply involved in the assessment process for many years and has tested and pioneered various systems. To provide the reader with some appreciation for the number and variety of data systems that have been and are being developed, the final section of this paper will briefly summarize a sampling of the work by the professional staff at ESBOCES and its Data Warehouse that is responsible for maintaining all of the test data from students on Long Island. Please note that this summary is by no means exhaustive.

## DataMentor

This data management/analytic system was developed by Genesee Valley/Wayne Finger Lakes Educational Technology Services (EduTech). EduTech is one of the 12 Regional Information Centers in New York State that provide administrative and instructional technology services in New York.

DataMentor was designed to enable teachers, administrators, and other educational specialists to participate more directly in data-driven decision making. The system allowed these groups to display regional assessment data in a variety of forms and provides an array of options for determining student progress on an individual, classroom, and district basis. At the same time, the system provided important information regarding class, grade, school, and district needs. The system provided a user-friendly online video tutorial that led teachers and other educational specialists through the various options available on the DataMentor system. It also provided educational resources to assist teachers and administrators with improving curricula in areas in need of remediation based on state standards in combination with standardized state test scores.

Following the tutorial, the viewer was presented with a series of of options. Included among these are analyses of assessment results and the identification of performance gaps at class, grade, school, and district levels. Additionally, information was provided on performance indicators that enabled teachers to drill down and determine which specific areas and types of questions linked to state standards are students performing well on and on which are they performing poorly. In these analyses, well and poorly were defined by performance gaps in which grades, schools, and/or districts may be compared to the general region. Finally, DataMentor also provided a plethora of professional development services including lesson plans and links to websites for teachers that provide a host of educational materials in specific content domains.

Much of the data and other information provided by DataMentor came in the form of charts. Charts were available to explore performance gaps, to identify trends in the data over extended periods (up to five years), to observe linkages between specific New York State performance standards and individual test questions. As the DataMentor website emphasized, the goal of these charts was to allow teachers to "view the data in a variety of formats" and to "seamlessly move from data to instruction".

## BOCES Achievement Reporting System (BARS)

While the DataMentor system was extremely useful to district personnel in Suffolk County that subscribed to the system, it was extremely expensive to maintain. As financial constraints increased for schools and support systems on Long Island, the system became too costly and is no longer available through ESBOCES. It has been replaced by the BOCES Assessment Reporting (BARS). Previously, district staff used BARS to analyze individual student data, while Datamentor analyzed regional data. The BARS system is currently available for use by districts on a subscription basis. A number of school districts are currently utilizing the system and professional development training and workshops have been developed and instituted during the past couple of years. A professional development screencast outlining the system may be found at http://datacentral/ esboces. The screencast was developed to introduce teachers/administrators to the BARS system.

BARS provides subscribers with about 20 different types of reports, many similar to one another though presented on the computer screen in different fashion. The reports are data-driven and allow teachers to examine the test scores from students they taught the previous year and scores from their new class of students as well. By examining the previous class, a teacher can identify areas of instruction where they might need to improve. By examining the current class, a teacher can identify areas where the students are weak and in need of improvement as well as areas of strength where vertical enrichment would be possible. Predictive analyses are currently underway to determine whether individual districts have been successful at achieving Adequate Yearly Progress (AYP) as specified in NCLB.

The BARS system is constantly updated with new test information being added as it becomes available. An important feature of the system, $p$ value comparisons, enables the user to conduct multiple comparisons which include predictor variables such as gender, race/ethnicity, special education, etc. Such adaptability is valuable because it provides the opportunity to explore in more detail whether specific sub-groups are meeting standards and, if not, where each may be in need of additional instruction. Districts may also benefit from customized assessment reports which provide districts with requested data outcomes. In light of the requirement in No Child Left Behind legislation that all groups show AYP, such a feature becomes critically important.

An additional feature allows the teacher to click on a specific question which then provides resources that should be helpful for providing appropriate instruction in the content area assessed by a particular question. One such resource is a link to Vital, an educational resource provided by public television.

As we move to the Common Core Standards, however, this option is no longer available. Now, test questions are no longer available. Instead, the New York Learns Partnership will maintain a bank of former questions. District personnel may then refer to former questions associated with specific performance indicators that will continue to be provided.

Another noteworthy system is the Northwest Evaluation Association (NWEA) system. Combining adaptive technology, assessment content, vertical measurement data and educator resources, the system provides a stable, reliable growth measure for students. Additionally, the data provide teachers, administrators, and policy-makers reliable and accurate verification of this growth.

It should be noted, however, that NWEA measures growth based on individual student learning, not on proficiency. Currently, New York State is looking at growth based on proficiency. Many individual districts are using or considering the NWEA assessment as a resource in the Teacher Evaluation Process to support teacher effectiveness as measured by individual student growth.

BEACON was recently developed at ESBOCES as any early warning system for school counselors to identify students in danger of dropping out of school. The system employs criteria established through scientifically-based empirical studies and the indicators identified in these studies. The basic assumption underlying the system, currently being beta-tested in two school districts, was that dropout could be predicted by an array of student characteristics which included data on school attendance, discipline, and grades. More specifically the system inputs the following information to identify levels of risk for dropping out:

1. Last month attendance
2. Past year attendance
3. Overall grade point
4. Math grade
5. English grade
6. Number of Fs
7. Disciplinary problems

The system requires no data entry by the counselors as the information is added on a daily basis as part of each school's student management system. When the counselors $\log$ on to the BEACON system, they are presented with a color-coded dashboard that reflects both the individual student's risk status as well as the general risk status of their particular school. Risk status moves from the color green (no risk) to the color red (high risk) with a series of graded colors in between.

The system may be tailored to individual schools in various ways. For example, a red flag next to a student's name indicates immediate risk of drop out and this red flag is determined, in part, by each school's cut point on student achievement tests. Moreover, different factors such as grades or attendance could be assigned different weights in the prediction system based upon school characteristics (percentage of bilingual students) or student characteristics (gender). The flexibility of the system will also enable school personnel to examine dropout and relate it to a host of factors including age, grade level, and number of credits earned by the student and to examine the effectiveness of the interventions applied to arrest school dropout.

The system can also be used in a reverse fashion to predict a student's readiness for college. To accomplish this, the system will develop a student profile based on factors including number of AP credits, overall GPA, ELA and math GPA, extra curricular activities, etc. Again, this system will be tailored to specific schools and to specific student characteristics as they are identified through empirical analyses.

Mindful too of Wohlstetter et al.'s knowledge component, Eastern Suffolk BOCES staff felt that data teams may require structured assistance as they engaged these data sources. That is, they needed to be sure that they were asking the "right" questions with respect to their data. (Ronka, Lachat, Slaughter, \& Meltzer, 2008). As a result, in collaboration with Dowling College they compiled and distributed a set of essential questions for their data team coaches to assist school-based teams in isolating fundamental root cause issues that drive student achievement and help them develop more meaningful and realistic goals and strategies for remediation.

For example, teacher members of inquiry or school improvement teams often may not have been trained in using data effectively on school-wide program, a classroom, or for individual student dimensions. And while data systems such as those noted above can provide a multitude of information, it is often necessary to help provide further focus. Providing a set of Essential Questions can provide this focus. These questions were developed to identify specific data points to address specific questions. Questions
were then assembled as a series of leveled questions to provide districts with directions they could follow in answering their tailored data analyses. Further, questions properly asked will enable such teams to refine their thinking along root cause themes such as systemic issues, longitudinal trends, and disaggregated sub group needs.

## Conclusions

This paper summarizes some of the key concepts and educational practices that have grown up in response to a new era of assessment and data-driven decision making. It has also provided a case study example of systems used and/or developed for use on eastern Long Island.

There can be no question that American public education is currently in the grips of an assessment era characterized by scientific-sounding terms like "data-driven decision making" and "evidence-based practice." For many, both within and without the field, the emphasis on data and its use to enhance student learning is now taken for granted. It is essential, however, that careful and systematic study of the new information systems spawned by this movement be undertaken. This study should examine not only the extent to which these systems are actually used by teachers and administrators, but the ways in which they are used and the impact, whether significant or not, on student achievement and ultimately student success following graduation. To do less would be to ignore the basic principles upon which the movement has developed.

The second article in this two-part series begins with a discussion of the book, Driven by Data (BambrickSantovo, 2010), which is currently influencing the process of data-driven decision making on Long Island and throughout New York State.

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## SCHOOL DISTRICT ALMANAC Publications: Data Points, Vital Signs, Budget Pulse, School Atlas, and Geo-Tracks

## Featuring statistical data available to Superintendents and School Board Members, helpful for short and long term planning of educational goals



If the fact that the search term rubric on Amazon yields at least hundreds, if not thousands of results, is not evidence enough, try inquiring as to the word's use with any school-aged child for proof of the pervasive influence of this tool of assessment and instruction. While rubrics, arguably among the most popular educational innovations of recent times (Goodrich Andrade, 2001), may be created for, and applied to, any school subject at almost any level, they are most commonly used in educational settings to guide and evaluate writing, the assessment of which is a thorny issue at best. Unlike the isolated skill of addition, for instance, writing presupposes the development of an array of skill sets including, but not limited to, the rhetorical, the conceptual, and the linguistic (Deane, 2010; Moffett, 1983), linking writing in all but its most mundane modes inextricably to the thinking that is at its source, and is often produced as its outcome (Hillocks, 2002 Moffett, 1983; Russell, 1995). As consequence of this complexity, traditional letter or numeric grading of writing has been perhaps rightly criticized for its necessarily evaluative subjectivity that may have the consequence of leaving students not only wondering where writing had gone astray, but also clueless how to remedy it. While rubrics can themselves be poorly constructed or even misused, proponents emphasize that, implemented knowledgeably and reflectively, they offer a way to overcome arbitrary grading, and have the potential to meaningfully inform instruction (Goodrich Andrade, 2001; Saddler \& Andrade, 2004; Spandel, 2006).

Beyond this commonsense view, however, is another more troubling perspective on writing rubrics. Developed and employed by test creators to be used in a criterion- or standards-based context, rubrics are purported to improve inter-rater reliability by limiting and defining the evaluation criteria, and restricting measurement scales to explicitly delineated performance levels (Hillocks, 2002; Mabry, 1999). It was, in fact, a large-scale study conducted by Educational Testing Services that ultimately resulted in the five essential factors of good writing fundamental to most writing rubrics today (Ideas, Form, Flavor, Mechanics, and Wording), but the research leaders acknowledged that in creating this list, they were imposing order, not describing it. Of the almost 16,000 annotated and graded papers used in the study, only the approximately 3500 that revealed consistent perspectives on elements of writing
were considered, and elements that resisted categorization were ignored or eliminated (Wilson, 2006). Notably documented, but omitted, were thirteen categories including Originality of Expression, Humor, and Presents Opposing Idea (Wilson, 2006), terminology that suggests elements of a writer's internal intention, that very ingredient that creates the engagement necessary for making visible through the written word both conscious and subconscious thought (Elbow, 1973; Wilson, 2010), and implicates both the broad range of skills, and complex processes of thought, reflection, and expression inherent in the act of writing (Hillocks, 2002; Moffett, 1983; Russell, 1995). From this perspective, rubrics may be viewed at best as inadequate gauges of student writing achievement, and at worst counterproductive in that pursuit. In the context of an educational atmosphere in which student achievement and assessment are yoked to accountability, questions surface about the effects of rubrics on both teachers and students. What assumptions underlie the use of rubrics in the teaching and evaluation of writing? How does the use of rubrics affect how writing is taught, what kind of writing students learn, and teacher and student perceptions of writing? In short, what do rubrics say?

One assumption underlying large-scale writing assessments, and the rubrics that go along with them, is that good writing is fixed and consistent, regardless of context, and as such can be validly measured through standardized tests and according to universal, objective criteria. The pedagogy implied by this perspective exemplifies one aspect of the "alchemy of school subjects" described by Popkewitz (1998) in which a process of normalization is at work that treats knowledge as self-evident, and immutable, a kind of "uncontested and unambiguous content for children to learn" (Popkewitz, 1998, p. 27). Thus, if teachers are doing their jobs well, student writing will develop steadily and linearly, and milestones of achievement will be predictably sequential, readily observable, and reliably testable. Despite research that challenges these assumptions with evidence that writing development is most often uneven, and is cognitive as well as practical, typically involving progress that is not always visible on the page (Sommers, 2008), the alchemy inherent in writing rubrics allows students to be "placed within a continuum of norms" (Popkewitz, 1998, p. 28) that serves to include and exclude individuals, while appearing to operate within a framework of logic and fairness.

Because of the influence of teacher evaluation and accountability, and given that testing has become attached to "high-stakes" consequences, including, but not limited to, deficit labeling (for students, teachers, and schools alike), denial of graduation, and threat of loss of employment, it is perhaps no surprise that teachers often act in what they believe to be both their own and their students' best interests by "teaching to the test," and conforming to, if not professing to believe in, the construct of the rubric. It is, after all, at least in part through the situating of their students as "succeeding" or "failing" that teachers too are situated along a continuum of norms. Although some research shows that teachers might sometimes sense the inadequacies of standardized assessments and rubrics either to engender or recognize "good" writing, they nonetheless sponsor them in classrooms (Applebee \& Langer, 2011; Hillocks, 2002; Mabry, 1999). Both Mabry (1999) and Hillocks (2002), for example, interviewed teachers who were confused about how the state defined writing proficiency, and expressed concern that teaching to the test was not "real" teaching. In reference to the Illinois writing assessment, a teacher quoted by Hillocks (2002) said, "I feel like the [assessment] is just imposing something upon us that isn't real, and it isn't real to the kids, and it's very artificial" (p.133). Another said he had a "nagging feeling" that "if you're teaching for a test, you're not teaching" (Mabry, 1999, p. 9), and a principal remarked that the writing assessment in Illinois represented a "cookbook approach" that was "very one-dimensional," but concluded by saying that standardized assessments were "here to stay, and it's only going to get bigger" (Hillocks, 2002, p. 130). Viewed in this context, some of what rubrics, standardized writing assessments, and indeed standardized knowledge in general, compel teachers to do is to normalize what might otherwise seem irrational, and to persevere in teaching writing according to the constraints of rubrics and assessments, despite a recognition of their inherent inadequacy either to generate or identify "good writing." As state assessments continue to exert control over curriculum, teachers begin to doubt their roles, and more readily relinquish authority and agency over both writing curriculum and pedagogy (Mabry, 1999). Thus, in the words of Rose (1996), teachers, like all subjects in a modern liberal democracy, "make decisions about their self-conduct surrounded by a web of vocabularies, injunctions, promises, dire warning and threats of intervention, organized increasingly around a proliferation of norms and normatives" (p. 46).

Teachers not only frequently use rubrics similar or identical to those on standardized tests to familiarize students with what will be expected of them on assessments, but also to guide them during the actual writing process (Hillocks, 2002; Ketter \& Pool, 2001; Kohn, 2006). Inasmuch as rubrics tend to focus attention on components of writing, rather than on its overall effect (Mabry, 1999), and given that formulaic writing is strongly suggested by rubric criteria, students seem to have little choice but to concentrate more on how well they're adhering to the rubric than on what they're writing (Hillocks, 2002;

Ketter \& Pool, 2001; Kohn, 2006). While rubrics do offer a way to clarify to students the standards against which their work will be judged, to expand notions of revision beyond the mechanical, and to guide feedback about progress towards those standards (Andrade, Du, \& Mycek, 2010; Spandel, 2006), and evidence exists that English language learners and students with learning or other disabilities in particular can benefit from the explicit nature of rubrics (Schirmer \& Bailey, 2000), what students may at the same time be learning is simply to imitate a rough approximation of some narrowly defined process and product of writing. Such imitation may on one level allow students to "improve" their writing, but at the same time leave them incapable of ever achieving the purported goal of learning to write. Inasmuch as rubrics take a constituent approach, aiming for analytic evaluation that focuses attention on specific, externally-defined components of good writing, they misrepresent writing as an autonomous and generalizable skill comprised of discrete elements, rather than as a variegated tool that functions synergistically with thinking to accomplish a wide variety of objectives.

Although some research shows that students may sometimes feel comfortable in classrooms in which writing instruction is repetitive, routinized, and aligned with standardized test requirements, and that many of these students might in fact improve their ability to respond to writing prompts modeled on those of state assessments (Ketter \& Pool, 2001), the caveats of these findings are clear: one, students might feel more comfortable simply because routine, repetitive tasks are less engaging, and therefore "easier" in the sense that they are less intellectually taxing; and second, evidence of improvement with state writing prompts does not necessarily equate to an improved ability to write. As students become more and more accustomed to the routine of having rubrics by which to construct their writing, some become utterly dependent upon them, seeming, in the words of one teacher, "unable to function unless every required item is spelled out for them in a grid and assigned a point value" (Kohn, 2006, p.13). Thus, for students as well as teachers, rubrics become what Mabry (1999) calls "arbiters of quality and agents of control" (p. 678), and function as one of many means by which education creates "socially disciplined persons" (Hunter, 1996, p. 155).

If, as Hunter (1996) theorizes, the school is but an "improvised historical institution...providing a means of dealing with specific exigencies; and capable of nothing more than contingent solutions to limited problems" (p. 148), then what is the "problem" addressed by rubrics? Russell's (1995) description of writing as "a tool for accomplishing objectives beyond itself, [a] tool continually transformed by its use into myriad and always-changing genres" (p.57), renders writing as perhaps impossibly complex, difficult to teach, and resistant, if not impervious, to generalized evaluative criteria. From one perspective then, writing rubrics may be viewed benignly, as a straightforward attempt to reign in the complex miscellany of written communication, justifiably heralded for their potential
to scaffold writing and "help students develop the self-regulating skills needed to successfully manage the intricacies of the writing process" (Saddler \& Andrade, 2004, p. 49); in this regard, what rubrics do is reasonable, accomplishing a simultaneous transformation of the teaching, learning, and assessing of writing into sets of manageable components. From another perspective, however, what writing rubrics may also do is circumscribe "acceptable" forms of writing, and reinforce conformity in ways that devalue, or indeed eradicate, the often very much unmanageable, perhaps dangerous, and most likely unassessable, potential inherent in written language. Complacent in the received wisdom of rubrics, we may miss that what rubrics "say" is what we may (and may not) write.

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#### Abstract

In this paper, I investigate the types of schools (grade configurations) that fifth-grade students attend and how these institutions differ in academic and social climate. While there is extensive research pertaining broadly to middle schools, a focus on 5-8 schools has been omitted. These schools represent only a small proportion of existing middle schools, but fifth graders are considered a vulnerable population. The Early Childhood Longitudinal Study- Kindergarten Class of 1998-99 (ECLS-K) is employed to compare characteristics of K-8, K-6, and 5-8 schools attended by fifth graders. ECLS-K is the only existing national data set providing grade configurations attended by fifth grade students and the data are only available under a restricted use license. K-8 and K-6 schools are hypothesized to provide more favorable structural and contextual characteristics. The analysis shows that 5-8 principals and teachers view their schools as less favorable communities than those in K-6 and K-8 schools, especially the former. Specifically, 5-8 schools manifest more student misbehavior, greater use of alcohol and drugs, less parent involvement, more teacher turnover and absenteeism, and the schools are generally less safe. The 5-8 middle school should be re-examined as a suitable environment for fifth grade students. K-8 schools leaders might incorporate some elements of the school climate that is typical of K-6 schools into their schools, wherever possible.


## Introduction

Middle schools have received considerable interest from parents, educators, and the educational research community in recent decades. The middle school notion has undergone "continual tinkering" (Weiss \& Kipnes, 2006) for the last fifty years. The junior high school model serving grades 7-9 was the predecessor to the more modern "middle school." It emerged in the early 1900s, due to increasing awareness that early adolescence was a unique stage of development with distinct needs. Once the junior high school model began, it spread very quickly as a school reform (Cuban, 1992) and was soon perceived as the norm (Clark \& Clark, 1993). Not too many years passed before the realization occurred that
these schools were not an ideal solution. Some have argued that junior high schools were just miniature versions of high schools (Cuban, 1992).

In 1900, the dominant organizational structure of schooling was K-8 and 9-12. Rapid increases in immigration, industrialization, and urbanization, however, led to increased school enrollments, the need for a better prepared workforce, and pressure from higher education to begin college preparation courses before the ninth grade (Brough, 1995; Cuban, 1992; Eliot, 1898). There also emerged at this time a concern for the plight of early adolescence, perhaps most notably in the classic work Adolescence by G. Stanley Hall (1904). The movement to the middle school model in the 1970s was in part due to the dissatisfaction with junior high schools but also because students were reaching adolescence and puberty sooner than did children in previous generations (Tanner, 1962).

A new model for schools serving early adolescents -the middle school -emerged in the 1960s. Middle schools typically include grades 5-8, 6-8 or 7-8. The National Middle School Association (NMSA), established in 1973, articulated a vision for successful schools for 10- to 15-year-olds, including "courageous, collaborative leadership, an inviting, supportive, and safe environment, and school-initiated family and community partnerships" (National Middle School Association, 2003, pp. 1-2). However, research on middle schools has identified problems inherent to this model and they have been under scrutiny because of negative outcomes for both students and teachers in these schools (Gootman, 2007; Weiss \& Kipnes, 2006; Cook, MacCoun, Muschkin, \& Vigdor, 2008; Anderman, 2002; Ingersoll, 2003; Jovonan, Le, Kaganoff, Augustine, \& Louay, 2004).

In some cases, this scrutiny has led to policy changes affecting the availability of middle schools. A recent trend in several districts (Cincinnati, Cleveland, Milwaukee, New York City, Philadelphia, Portland, and Kansas City, MO, for example) is to remove students from middle schools and place them into new or expanded K-8 schools (National Forum to Accelerate Middle-Grades Reform, 2008). In 2004, New York City began the process of
closing many of its 218 middle schools because of such problems. Gootman (2007) describes how New York City, as well as others such as Philadelphia and Baltimore, have begun to dismantle middle schools and place many of the middle-school level students in K-8 schools. Other remedies have also been used, such as reform strategies in middle schools (National Forum to Accelerate Middle Grades Reform, 2008; National Middle Schools Association, 2003). But, the movement of students into K-8 schools from middle schools generally lacks high quality research-based evidence showing that this is an effective solution to problems associated with middle schools. In fact, some evidence suggests that there are few differences between K-8 and middle schools in either structural features or outcomes (Weiss \& Kipnes, 2006).

But Hough (2003) notes that there are few quantitative empirical studies evaluating middle schools compared to qualitative studies and literature reviews. A more specific gap in the literature is quantitative analysis using large-scale data that compares schools of different grade configurations containing middle grade students (National Forum to Accelerate Middle-Grades Reform, 2008; Weiss \& Kipnes, 2006; Cook et al., 2008). Considering that some school districts across the country are dismantling their middle schools and placing the students into various other school forms, there is an urgent need for this type of comparative, empirical research.

Several recent studies have reported that attending a 6-8 or 7-8 middle school is associated with lower academic performance in both reading and mathematics. In a New York City study, Rockoff and Lockwood (2010, p.1051) used panel data and found that "moving students from elementary to middle schools in 6th or 7th grade causes significant drops in academic achievement" relative to their counterparts who do not move and remain in K-8 schools Similarly, West and Schwerdt (2012) examined statewide data in Florida and reported that students who went to a middle school in grades six or seven experienced a drop in achievement compared to their peers who stayed in K-8 schools. This drop was observed in the first year and in subsequent years in the middle school. Both of these studies suggest that a return to K-8 schooling may be advisable during the middle school years. Of course, some or all of this drop in scores for middle school students may be due to transition and not the actual quality of the schools. Neither of the above studies examined results for 5-8 schools. Schwartz, Stiefel, Rubenstein, and Zabel (2011, p. 293), however, in yet another New York City study, report that "students moving from K-4 to 5-8 schools or K-8 schools outperform students in other paths." The other paths are 6-8 and 7-8 schools.

While there is research pertaining broadly to middle schools, a focus on 5-8 schools has been omitted. These schools represent only a small proportion of existing middle schools but fifth graders are considered a vulnerable population. This heightened vulnerability of fifth and sixth graders in middle schools with grades 5-8 or 6-8 has been noted
often in the literature (Eccles, Wigfield, Midgley, Reuman, Mac Iver, \& Feldlaufer, 1993; Bedard \& Do, 2005; Cook et al., 2008; Balfanz, 2009). Moreover, there is a gap in the research comparing the social organizational characteristics of 5-8 schools to schools with other grade configurations, namely K-8 and K-6 schools.

In this paper, I employ The Early Childhood Longitudinal Study- Kindergarten Cohort (ECLS-K) to investigate the types of schools (grade configurations) that fifth-grade students attend and how these institutions differ in academic and social climate. ECLS-K is the only existing national data set providing grade configurations attended by fifth grade students and the data are only available under a restricted use license. The ECLS-K includes students who were surveyed in the fifth grade, along with their teachers and principals, providing a unique opportunity to study the school climate of schools attended by these students. ${ }^{1}$ This paper focuses on the academic and social climate of schools measured by responses aggregated from principals and teachers. An examination of these contextual school characteristics is by far the largest void in the research on middle schools (Braun y Harycki, 2001). I examine school variables, including aggregated student behavior, alcohol/drug use, school safety, parental involvement, and teacher turnover by type of grade configuration. The overall purpose is to determine if the middle schools attended by fifth graders are significantly different from K-8 schools and K-6 schools attended by fifth graders.

## Review of Previous Research

Eccles, Lord, and Midgley (1991) found that the environments in middle schools can negatively affect students' sense of belonging and attachment to the school. Anderman (2002) compared middle-grade students in K-8 or K-12 schools to those in other school forms and found that students in K-8 or K-12 schools reported slightly stronger feelings of belonging. Belonging was positively related to GPA and optimism and negatively related to depression, social rejection, and school problems, such as relationships with peers and teachers. Eccles and Midgley (1989) reported that students in middle schools (grades 6-8 or 7-9) were likely to experience a variety of personal difficulties, including a decline in lower academic motivation. Byrnes and Ruby (2007) reported that traditional K-8 schools had higher average student achievement than middle schools. Weiss and Kipnes (2006) studied the effects of middle and K-8 grade configurations in Philadelphia. By the end of eighth grade, students in middle schools exhibited lower self esteem and a higher degree of perceived threat regarding their safety compared to students in K-8 schools, controlling for a broad range of individual and school level variables.

A number of researchers have studied the influence of grade configuration on safety, violence, and misbehavior in schools. Astor, Meyer, and Pitner (2001) showed

[^0]that 6th graders in middle schools were more likely than 6th graders in elementary schools to perceive threats in school. Anderman and Kimweli (1997) reported that students attending a K-8 or K-12 school were less likely to have been victimized, less likely to report getting into trouble, and less likely to feel their school was unsafe in comparison to students in middle schools (with grades 6-8 or 7-9). A study from the National Institute of Education (1978) found that students in grades 7-9 who were in schools with a 7-12 grade span exhibited less violence than grade 7-9 students who were in middle schools. A similar pattern was found by Blyth, Thiel, Bush, and Simmons (1980) who found that students reported being victims of violence more in middle schools than in K-8 schools. Cook et al. (2008) found that sixth grade students attending middle schools were significantly more likely to be cited for disciplinary problems than sixth graders attending K-6 schools.

Early adolescence is a time in which parental involvement is particularly important (Steinberg, 1990; 1996), including parental help with the transitions involved in middle schools (Lord, Eccles, \& McCarthy, 1994). Parent involvement in their adolescents' lives and close communication are positively related to school achievement and psychosocial adjustment (Steinberg, Elmen, \& Mounts, 1989). The more involved parents are in their children's schooling, the less the risk for school and behavior problems (Jessor \& Jessor, 1977).

But, evidence shows that parental involvement declines from elementary to middle schools. Eccles and Harold (1996) found that parental involvement, defined as volunteering in school, declined from second to fifth grades, but this decline was greater for fifth graders who were in middle schools. In an analysis of two national surveys, Chen (2001) demonstrated that parents of middle school students participated in fewer teacher-parent conferences and school activities than parents of elementary school students. Parents of middle-school students reported receiving less information from schools about helping children with homework (Chen, 2001). In an analysis of SASS data, Juvonen et al. (2004) found that middle schools offered fewer workshops, courses, and services to support parental involvement (such as child care) for parents than elementary schools.

Reviewing research in the 1970s and 1980s, Eccles and her colleagues compared the characteristics of middle schools and elementary schools (Eccles \& Midgley, 1989; Eccles, et al., 1991; Eccles et al., 1993). Specifically, they noted that elementary schools were characterized as follows: small schools, small groups, more individualized instruction, heterogeneous (not tracked) classrooms, close relationship of students to one or two teachers, same classroom with same classmates, and the fifth and sixth graders are the oldest in school. By contrast, middle or junior high schools are generally characterized by: large size, students changing classrooms and teachers from one period to another, multiple teachers, distant teacher-student relationships, increased between-class ability grouping (tracking), and greater emphasis on teacher control and discipline. In
addition, fifth- and sixth-grade students are the youngest in typical middle schools. Thus, students in middle schools may experience more feelings of anomie at a time in their lives when they need a sense of community. Perhaps K-6 and K-8 schools may help students to feel more connected and to participate more in school activities than middle schools (Blythe, Simmons, \& Bush, 1978).

## Theoretical Perspective

In theory, middle schools were created in order to provide greater attention to the developmental needs of early adolescents. Educators advocated for school structures such as small learning communities, houses, informal advisories, teaming, and flexible scheduling in middle schools to create a more familial atmosphere. The idea was that these structures would create a similar academic climate to elementary schools, allow for more monitoring of students by teachers and more personal connections between students and teachers across different content areas (National Forum to Accelerate Middle-Grades Reform, 2008). This theory has been rearticulated many times since its initial statement from the National Education Association in 1899 (NEA, 1899). During this century, junior high schools and later middle schools continued to grow, but many failed to successfully implement the theoretical ideal (Gruhn \& Douglass, 1956; Alexander \& George, 1981; Juvonen, et al., 2004).

At some point, all students move from the small, intimate, secure social environment of elementary school to a larger, more impersonal, typically bureaucratic middle school or junior high school. The only exception to this is students who actually begin and end their primary and secondary education in a K-12 school. Social scientists, from Durkheim (1951) forward, have identified the larger settings as highly conducive to feelings of anonymity, alienation, and loneliness. In schools, anomie and disengagement might be indicated by high teacher and student absenteeism, high teacher turnover, student tardiness, and disengagement (Steinberg, 1996). Middle school teachers are less likely to know their students as well as elementary school teachers because middle schools are larger, more departmentalized, and less personal. Teachers in middle schools have less trust in their students, believe more strongly in controlling and disciplining students, and have a weaker sense of teaching efficacy than elementary school teachers (Midgley, Feldlaufer, \& Eccles, 1988). Middle school teachers may feel that it is more difficult to produce achievement with such a large number of students who they see for a just part of the school day (Midgley et al., 1988).

Brough (1995) observed that by the 1960s, middle schools were characterized by departmentalization and strict schedules rather than in ways advocated by middle school researchers and educators, including integration, exploration, and socialization (Gruhn \& Douglass, 1956). The bureaucracy of middle schools makes it more difficult for teachers to have a sense of trust and efficacy and also give students some degree of autonomy. The more bureaucratic the
environment, the more rigid the rules for the teacher as well. Teachers in more bureaucratic schools report having less control over the curriculum and school policies and less autonomy in their jobs (Ingersoll, 2003). This may also translate into providing less autonomy for their students. A lower level of control is related to teacher dissatisfaction and higher levels of teacher turnover (Ingersoll, 2003). In fact, Smith and Ingersoll found that beginning teachers in middle schools were almost twice as likely as elementary school teachers to leave after the first year (Smith \& Ingersoll, 2004). It could be that middle schools create a perfect storm of teacher and student dissatisfaction that leads to both parties becoming disengaged.

The negative impact of middle schools may be greater among the younger students (fifth or sixth graders). For example, Balfanz (2009) reports the youngest students in middle schools, typically fifth or sixth graders, are most at risk of falling off a standard graduation path. Students who manifest at-risk outcomes in the sixth grade, such as extended school absence and course failures, were less likely to graduate on time than students who began having academic trouble in the seventh grade. Fifth graders may be of even greater risk in a 5-8 schools than sixth graders in a 6-8 school.

Thus, middle schools generally operate from a rationale bureaucratic model, especially in comparison to more communal K-6 and K-8 schools. In fact, they were always designed to be larger, more formal, more specialized, and more differentiated in most respects than elementary schools. By contrast, K-6 and K-8 schools are more likely to emphasize informal social relationships, a high degree of teacher/parent/student interaction, and a communal model. This bureaucratic theory of why middle schools are likely to be less effective educational organizations fits nicely with the full body of work of Lee and colleagues (Lee \& Smith, 1993; Lee, Smith, \& Croninger, 1997) and Bryk and colleagues (Bryk \& Driscoll, 1985; Bryk, Lee, \& Holland, 1993). In this respect, I hypothesize that K-6 and K-8 (and especially K-6) schools possess structural and contextual characteristics that are more likely to be viewed as effective schools than middle schools (5-8).

In the following analysis, I examine nearly two dozen aggregated school-level variables to advance knowledge of the academic and social climate existing in $5-8$, K6 , and K-8 schools attended by fifth-grade students. This allows a close order view of these three different school types attended by students who as noted previously are likely to be among the most vulnerable in the middle school form. The focus is on the social and academic context of these schools. The study overcomes some of the past limitations by more precisely defining three school configurations attended by fifth graders. The study excludes several more prevalent school types such as 6-8 or 7-8 where fifth graders would not be present since the sample only contains fifth graders. This is both a strength and limitation of the current study.

## Research Questions

1. Do aggregated academic and social climate variables vary according to the type of school? Nearly two dozen variables measuring academic and social climate are aggregated to the school level and the results are examined across three distinct types of schools (58 , K-8, and K-6). As noted below, each of the three school types contains various grade spans, but the configurations of $5-8, \mathrm{~K}-6$, and $\mathrm{K}-8$ are mutually exclusive.
2. Do aggregated school climate variables vary by school type after controls are added for possible spurious effects? Several variables, in particular, are needed to ensure nonspurious results. First, control for school size is critical since middle schools are larger. Second, it is necessary to control for race composition, urbanicity, and socioeconomic composition of the students since the schools do differ on these social contextual variables.

## Data and Methods

Data from the Early Childhood Longitudinal Study - Kindergarten Class of 1998-99 (ECLS-K) are used in this study. The ECLS-K was developed by the U.S. Department of Education, National Center for Education Statistics (NCES). Westat conducts the study, with assistance provided by the Educational Testing Service (ETS). ECLS-K follows a nationally representative sample of children who attended kindergarten in 1998-99 and concentrates on the early experiences of children starting in kindergarten through the eighth grade. Data were collected from students, their families, and their schools in the kindergarten year and in grades 1, 3, 5, and 8. Students and schools in kindergarten and first grade do represent a national random sample, but higher grades depart from this to some degree as students move to other schools but remain in the sample. But with this proviso, the sample is a very close approximation to a random sample of schools serving students in the fifth grade.

ECLS-K is a complex multi-stage, longitudinal study that includes data provided by parents, teachers, and administrators, along with school records. ECLS-K also includes achievement data on children, in the form of direct assessments given to each child by a trained assessor in the areas of reading, math, and science. The teacher-level information used in the current study is provided by the child's reading teacher. ECLS-K began in the fall of 1998 with an unweighted sample of 21,260 students (Tourangeau, Nord, C, Lê, Pollack, \& Atkins-Burnett, 2006). The sample size by 5th grade was 11,820 students in $1,970^{2}$ schools. The analysis in this paper is limited to public schools. Most private schools do

[^1]not employ the middle school model. Public schools that were reported by principals as primarily special needs schools ( 20 schools) were eliminated. Schools that reported having special needs classrooms somewhere in the school were included in the study. There were 320 of 1970 schools for which principals did not provide school grade span data. Due to these missing data and data restrictions, the total number of schools in this analysis is 1,630 . I use school and teacher data aggregated from the student-level file.

## Analyses and Results

The first stage in the analysis was to identify the grade configurations that were attended by fifth graders in ECLS-K. Principals answered a set of questions about the grade levels offered in their schools. The first step of the analysis was to determine all of the possible grade spans of the schools attended by the 5th graders in the data set. Specifically, principals indicated each grade level that was provided at the school (e.g. K, 1, 2, 3, 4, 5; 5, 6, 7, and 8, etc.). Using this information, all the possible grade spans of the 1,630 schools were created. A total of 42 possible different grade spans were identified in which 5 th graders could have been enrolled. In actuality, students were enrolled in only 26 of these 42 possible grade span configurations. This number of possible grade configurations for fifth grades is much larger than one might think and perhaps merits further investigation.

From these 26 configurations, four common grade span categories were created: $\mathrm{K}-6, \mathrm{~K}-8,5-8$, and $\mathrm{K}-12$. Most of the 5th grade students were in elementary schools that were either K-5 (500 schools) or K-6 ( 250 schools), and PreK-5 schools ( 380 schools). There were several other grade span configurations similar in structure to a K-6 school, such as 1-6 or 1-5. These were all classified in this analysis as K-6 schools. There are three grade span configurations that were classified as 5-8. The most common type of middle school configuration for fifth graders is one with a grade span of 5-8 (60 schools). Of course, the most
common type of middle school configuration in the United States is 6-8, but this grade span is not available here since the students are only in grade 5 . The most common K-8 school is indeed a K-8 school ( 80 schools), but there are about as many schools that are PreK-8 schools (50 schools).

The reader should bear in mind that these fifth graders could not be in a 6-8 school except for a very few students who were performing above grade level, but they are not included here. The grade span configurations are as follows:

1) Middle (5-8) Schools - Schools with the following grade configurations: Grades 4-8, 5-7, 5-8.
2) Elementary K-6 - Elementary schools with the following grade configurations: Grades 4-5, 3-5, 2-5, 1-5, K-5, PreK-5, $3-6,2-6,1-6, \mathrm{~K}-6$, PreK-6, 4-6, and 5-6. These are clearly purely elementary schools.
3) Elementary K-8 - Schools that had any of the following grade configurations: K-7, 3-8, 1-8, K-8, and PreK-8. These are schools that combine some of the traditional elementary grades with middle-level grades.

A fourth category (Combined School K-12) that contained combined K-12 schools (any school that had some combination of 3-12, 1-12, K-12, PreK-12, 5-12) was removed because there were too few schools within this category.

Table 1 shows the categories of the school type variable and the number of schools and students within each type. Eighty-eight percent of the schools in the ECLS-K 5th grade sample are attending elementary K-6 schools. Most of these schools labeled as K-6 are either true K-6 or K-5 as noted above. The bulk of these students ( 86 percent) do transfer into either a middle school in grades 6 or 7 or a junior high school, or into a 6-12 school. Although a smaller percent of the schools are either 5-8 or K-8, there are an ample amount of $5-8$ schools ( 60 schools) and K-8 schools (130 schools) to conduct the analyses.

## Table 1: School Grade Configurations for ECLS-K Fifth Graders

| School type | Number <br> of <br> students | Percent <br> of <br> students | Number <br> of <br> schools | Percent <br> of <br> schools |
| :--- | ---: | ---: | ---: | ---: |
| Middle schools (5-8) | 430 | 5.2 | 60 | 3.4 |
| Elementary K-6 schools | 7100 | 85.8 | 1440 | 88.4 |
| Elementary K-8 schools | 750 | 9.1 | 130 | 8.2 |
| Total | 8280 | 100 | 1630 | 100 |

Note: All sample size numbers have been rounded to the nearest ten as per NCES requirements for restricted use data.

The second stage of the analysis was to aggregate the student-level data file to the school level in order to examine the characteristics of schools and teachers by the three school types. This analysis examines both school and teacher characteristics from the fifth-grade wave of the ECLS-K. Information about the schools is provided by principals at the schools. These data include information on student alcohol and drug use, school safety, parent involvement, and teacher turnover. The teacher-level information is provided by the child's reading teacher since only the reading teacher provided information for all of the students. The reading teacher responded to questions covering a wide range including teachers' perceptions of student misbehavior and school leadership. These academic and social contextual variables are the focus of the analysis (see Appendix A).

In addition, I used several demographic contextual variables and a structural variable as covariate controls. Principals provided information on the percentage of minority students in the school, percentage of students who were eligible for free lunch, school size, and whether the school was in an urban, suburban, or rural area. For the variable percent minority, the aggregation results show the percent of the sample above a value of 4 (there are 5 values, value of 4 indicates $75 \%$ or more minority students in the school). Urbanicity was represented by a set of three dummy variables. For interval-level variables (school size and percent free lunch) mean values were obtained. The variables appear in Appendix $A$.

Once the file was aggregated, several descriptive analyses were conducted at the school level. For interval and ordinal level variables, simple means and ANOVA procedures were conducted to determine if significant differences existed on the variable by school type. For the nominal variables, cross tabulation and chi-square procedures determined if there were significant differences in the distribution of the data among the three school types. The independent variable in all of the analyses was school type (5-8, K-6, K-8) and the dependent variables were all of the school and teacher-level aggregated variables. I treat school size and the demographic variables as control variables in order to determine the nonspurious effect on the school climate variables (see Appendix A).

Preliminary analysis revealed that 5-8 schools exhibit less parental involvement in school programs and greater student absenteeism than in both 5-8 and K-8 schools than in K-6 schools. The same is true for student tardiness which is higher in 5-8 schools and K-8. Both 58 schools and K-8 schools manifest higher teacher turnover and higher teacher absenteeism than elementary K-6 schools. But in all of this, elementary K-6 schools consistently manifest lower scores (more favorable) relative to the other two types. Students at both 5-8 and K-8 schools are significantly more likely than students in K-6 schools to engage in attacks on students and teachers, bring weapons to school, engage in drug use, and employ security guards. Drug use appears to be significantly higher in 5-8 than in

| Appendix A <br> Descriptive Information on Variables in the Analysis |  |  |  |
| :---: | :---: | :---: | :---: |
| Variable Name | Mean | Standard Deviation | N of Cases |
| K-6 Elementary Schools (1,0) | . 886 | . 317 | 1630 |
| K-8 Elementary Schools (1,0) | . 079 | . 318 | 1630 |
| 5-8 Middle Schools (1,0) | . 035 | . 183 | 1630 |
| School size (1) 0-149 (5) 750 + ) | 3.612 | . 991 | 1630 |
| Percent Eligible for Free Lunch | 40.047 | 29.014 | 1630 |
| Percent Minority | . 328 | . 470 | 1630 |
| Rural (1,0) | . 185 | . 389 | 1630 |
| Suburban (1,0) | . 418 | . 493 | 1630 |
| Urban (1,0) | . 396 | . 489 | 1630 |
| Dependent Variable Composites |  |  | 1630 |
| Student misbehavior (Teachers) | 7.108 | 2.590 | 1560 |
| Alcohol and drug use (Principal) | . 0592 | . 25905 | 1590 |
| School Safety (Principal) | . 5613 | . 68300 | 1570 |
| Student and Parent Involvement (Principal) | 7.2041 | 2.74957 | 1550 |
| School Leadership (Teachers) | 6.5895 | 2.24079 | 1560 |
| Teacher Turnover and Absenteeism (Principal) | 3.5681 | 1.54166 | 1560 |
| Note: All sample size numbers have been rounded to the near as per NCES requirements for restricted use data. |  |  |  |

the K-8 schools. Students in the 5-8 schools are significantly more likely to use alcohol than students in either of the other two school types.

The aggregated teacher views are consistently unfavorable (higher) in 5-8 and K-8 schools than in K-6 schools. In some cases, the teacher beliefs in the 5-8 schools are more unfavorable, in some cases the views in K-8 schools are more unfavorable, and other times they are basically the same. However, teachers in both types of schools (5-8 and K8) are clearly more likely to see bullying, physical conflicts, and student misbehavior as a more serious problem than teachers in K-6 schools.

Similarly, 5-8 and K-8 school teachers perceive the academic standards as too low and they tend to have less influence over school policy. These middle school and K-8 teachers feel that the administration is less likely to communicate a clear vision to the staff and less likely to encourage the staff as well as administration in elementary K-6 schools. All of these negative teacher perceptions regarding 5-8 and $\mathrm{K}-8$ schools are consistent with the set of unfavorable conditions reported by the principal. All of the above observations were based on simple bivariate relationships.

In order to further pursue the analysis, a set of composite school level variables were computed from the aggregated teacher and principal items. These dependent variable composites were then regressed on a set of school type dummy variables along with a set of control variables, all at
the school level. The six dependent indices are: student misbehavior; alcohol and drug use; school safety; student and parent involvement; school leadership; and teacher turnover/absenteeism. Two separate factor analyses were conducted for all of these dependent items. One factor analysis considered only those variables with a percentage format and another factor analysis considered variables for which means had been computed. These analyses produced a total of six factors with all factor loadings at .5 or above. The alphas and item descriptions for each composite are provided in Figure 1. Four of the six composites have alphas at .6 or above while the other two composites are quite low (. 29 and .35). These low reliabilities are due to the fact that there are only two items in each of these composites and there is not a great deal of variance among the items. The school type variables (dummy variables) are 5-8, K-8, and K-6 (coded as 1 or 0 ). The omitted category is middle schools since this is the category against which the other school types are being compared. Given the coding of the dependent variables, a negative regression coefficient means that the problem (e.g. student misbehavior) is greater in the 5-8 schools. The following variables were used as controls: school size, coded 1 (small) to 5 (large), percentage of students eligible for free lunch (0-95\%), percent minority (coded as $1=$ greater than 75 percent and $0=75$ percent or less), and urbanicity (coded as two dummy variables- rural 1 or 0 , suburban 1 or 0 , and urban as the omitted category). These controls are employed because 5-8 schools are larger, more likely to be located in a small town or rural area, less

Figure 1: Dependent Variables (Composites)

| Composite | Variables in composite | Alpha |
| :--- | :--- | :---: |
| Student <br> misbehavior <br> (Teachers) | Bullying is a serious problem at school <br> Student misbehavior interferes with teaching <br> Physical conflicts b/w students a serious problem | .85 |
| Alcohol and drug <br> use (Principal) | Student use of alcohol at school <br> Student drug use in school | .29 |
| School safety <br> (Principal) | Attacks on students \& teachers at school <br> Students bringing weapons to school | .35 |
| Student and <br> Parent <br> Involvement <br> (Principal) | Student absenteeism is a problem <br> Student tardiness is a problem <br> Lack of parental involvement in the school | .71 |
| School <br> Leadership <br> (Teachers) | Academic standards are too low in school (agree) <br> Teachers have influence over school policy (disagree) <br> School administrator communicates vision to staff (disagree) <br> School administrator encourages staff (disagree) <br> Teachers have control over curriculum (disagree) | .72 |
| Teacher turnover <br> and absenteeism <br> (Principal) | Teacher absenteeism is problem <br> Teacher turnover is high | .62 |

likely to serve students who qualify for a free lunch, and more likely to have white students than either the K-6 or K8 schools.

Table 2 shows the effects of a K-6 grade configuration versus middle school configuration (left panel) and K-8 grade configuration versus middle school (right panel) on the six dependent variables. Table 2 provides the unstandardized regression coefficient for school type along with the standard error and the effects size (ES) for each coefficient. The ES is computed by dividing the unstandardized coefficient by the pooled standard deviation of the dependent variable. The ES for K-6 schools are all moderate (.27) to very large (1.33). Only two of the effects for K-8 school are statistically significant but they are moderate (.37) to large (.61).

These results show that K-6 schools have fewer student behavior problems and less alcohol and drug use than 5-8 schools (all coefficients are negative and statistically significant). In addition, K-6 schools are safer, have higher student and parent involvement, and have more effective school leadership than 5-8 schools. These findings provide strong evidence that the school climate in K-6 schools
is significantly more favorable than the school climate in 5-8 schools. But the effects are just barely significant with regard to school safety and school leadership. These effects remain as statistically significant school-level differences after controlling for school size, percent free lunch, percent minority in the schools, and urbanicity.

K-8 schools have significantly lower levels of alcohol and drug use than 5-8 schools and higher levels of student and parent involvement than middle schools. In this respect, they are similar to K-6 schools. An equally important finding, however, is that there are no significant differences between K-8 schools and 5-8 schools in terms of student misbehavior, school safety, school leadership, and teacher turnover and absenteeism. This suggests that 5-8 and K-8 schools may have a social and academic climate that is both alike and different. This is not unexpected given that K-8 and 5-8 school both serve students in grade 5 to 8 . Retrospectively, one might expect exactly what the results show: K-6 schools are safer with greater parent and student involvement, less teacher turnover, fewer problems with drugs and alcohol, and less student misbehavior, followed by K-8, and 5-8 in that order.

## Table 2

Effect of Grade Configuration on Teacher and Principal Perceptions of School Climate,
Controlling for School Size, Percent Free Lunch, Percent Minority, and Urbanicity

| Characteristic | K-6 Compared to 5-8 MiddleSchools |  |  |  | K-8 Compared to 5-8 MiddleSchools |  |  |  | N of Cases (Schools) |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | b (unstand. coefficient) | SE | Effect Size | Sig | b (unstand. coefficient) | SE | $\begin{aligned} & \text { Effect } \\ & \text { Size } \end{aligned}$ | Sig |  |
| Student Misbehavior | -1.084 | . 334 | -. 42 | . 001 | -. 593 | . 394 | -. 23 | . 132 | 1560 |
| Alcohol and Drug use | -. 345 | . 034 | -1.33 | . 000 | -. 157 | . 040 | -. 61 | . 000 | 1590 |
| School Safety | -. 181 | . 093 | -. 27 | . 051 | . 010 | . 108 | . 01 | . 926 | 1570 |
| Student and Parent Involvement | -1.116 | . 338 | -. 41 | . 001 | -1.018 | . 398 | -. 37 | . 011 | 1550 |
| School Leadership | -. 614 | . 303 | -. 27 | . 043 | -. 162 | . 357 | -. 07 | . 649 | 1560 |
| Teacher Turnover and Absenteeism | -. 482 | . 204 | -. 31 | . 019 | -. 319 | . 239 | -. 21 | . 183 | 1560 |

Note: All sample size numbers have been rounded to the nearest ten as per NCES requirements for restricted use data. Effect sizes were computed by dividing the unstandardized regression coefficient by the pooled standard deviation of the dependent variable.

## Conclusions and Policy Implications

A surprising and unexpected finding that emerged in the study is that there were 26 possible grade configurations that fifth grade children were attending in the ECLSK data. Although all of these grade spans were some variant of the typical 5-8, K-6, K-8 schools, further research might inquire about the characteristics of these numerous grade configurations. For example, some districts employ a system of K-3 schools, followed by 4-5 and then $6-8$, and finally $9-12$. In this paper, all the variations were collapsed into $5-8, \mathrm{~K}-6$, and $\mathrm{K}-8$. The K-12 configurations were not considered here.

This study compares the school climate in schools with three different types of grade level configurations that includes fifth graders. I find that 5-8 schools consistently contain conditions identified by school administrators and teachers that are typically viewed as not conducive to learning or a safe environment. These include more student misbehavior, greater use of alcohol and drugs, less parent involvement, more teacher turnover and absenteeism, and the schools are generally less safe. To a lesser extent, these findings also apply to K-8 schools. K-6 schools are the most trouble-free. There are several implications.

First, the 5-8 middle school should be re-examined as a suitable environment for fifth grade students. The paper suggests that either a K-6 or a K-8 school will provide a more favorable academic and social environment. Of course, questions remain about the progress of students in K-6 schools in the fifth grade who transfer of necessity to other types of schools. Although the results demonstrate a more favorable academic and social climate for fifth grade students in K-6 schools, these students must face the challenges of a new school in grade six and quite likely a middle school (6-8, 7-8, 7-9).

This will require a different analysis across the full variety of grade K-8 schools including 6-8 and 7-8. In the meantime, the paper provides support the strategy of moving students from 5-8 schools into K-6 or K-8 schools in many cities and towns across the nation as described earlier in the paper. The same strategy might apply to 6-8, 7-8, and 7-9 schools as well. And, K-8 schools leaders might incorporate some elements of the school climate that is typical of K-6 schools into their schools, wherever possible.

Quite purposely, I do not attempt to determine the effect of these fifth grade configurations on student academic outcomes as the results in ECLS-K would be inconclusive and possibly misleading. Fifth grade student outcomes would be problematic for two reasons: (1) test score data is conducted at the end of fifth grade only and there is no fourth grade data, and (2) 5-8 students have transitioned from another school unlike the K-6 and K-8 students who have remained in the same school for the most part. Eighth grade data, although available, is also problematic: all K-6 students transitioned to another school in the 7th grade but most 5-8 and K-8 students did not (Table 2).

The paper makes a small but important contribution to our understanding of the characteristics of schools serving fifth grade children who are a vulnerable and often overlooked population. Much more attention has been given to students in 6-8 and 7-8 schools that are the most common form of middle schools in the United States. The study of school effects is important, but we know since Coleman, Campbell, Hobson, McPartland, Mood, Weinfeld, \& York (1966) that the academic and developmental effects are almost always small. After replicating the Coleman findings, Jenks, Smith, Acland, Bane, Cohen, Gintis, Heyns, \& Michelson (1972) concluded that more attention should be directed at the quality of schools to assure that they are safe and enjoyable places for children to spend their time.

Some schools are dull, depressing, even terrifying places, whiles other are lively, comfortable, and reassuring. If we think of school life as an end in itself rather than a means to an end, such differences are enormously important. (p. 258).

A major contribution of this study is to add to the literature on middle schools by accurately comparing 5-8 schools to K-6 and K-8 schools. A trend in certain districts such as New York City and Baltimore has been to move students out of middle schools and into K-8 schools. This paper suggests that this may be advisable, but that fifth and sixth graders may fare better in K-6 schools. Schools with a K-6 grade configuration appear to be safer and more structurally sound schools, at least based on the school administrator and teacher aggregated responses. Of course, students in K-6 schools must go elsewhere after grade 6 . In the end, the paper leads the reader back to reconsider Goodlad's (1984) argument for a reformed set of instructional grade levels.

Some might argue that these findings are the simple result of the fact that children in K-6 schools are younger on average than students attending middle schools or K-8 schools. This is of course true. We hardly expect the majority of students in K-6 schools to be carrying weapons to school or using alcohol to the degree that older students do. Moreover, it is empirically known that parental involvement is higher in school programs during the first three or four years of school, but this does not obviate the problem outlined in this paper. Although this paper does not attempt to show the effects of these middle school structural problems on student achievement or on student self development, hypothetically, one would assume negative results of some sort. But the important educational policy is this: Five to eight schools are characterized by risky student behavior, high teacher turnover, low academic standards, and a discouraged and disempowered faculty. Thus, aside from the fact that this may be driven by the age of students across this grade span, the educational need is to provide some form of intervention that would mitigate these ineffective teaching and learning communities.

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# Does High School Educational Technology Competences Impact Scholastic Aptitude Test (SAT) Scores? 

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#### Abstract

This study determines if students' preparedness of educational technology in high school impacts their performance on the Scholastic Aptitude Test (SAT). Participants were currently enrolled in a four-year liberal arts college on Long Island that graduated from high school between the years 2001 and $2004(\mathrm{~N}=133)$. Participants were surveyed in order to determine their competence in educational technology. A discriminant analysis was conducted to determine if seven indicators of high school computer preparedness (spreadsheets, general computer use, advanced word processing, share information, PowerPoint presentations, basic word processing and ethical use of computers) can predict SAT performance. Three out of the seven dimensions, the ability to share information, the use of PowerPoint and spreadsheet knowledge demonstrated the strongest relationship with predicting SAT performance. These findings indicate the students' preparedness in educational technology may have a positive impact SAT scores.


## Introduction

The purpose of the following study is to evaluate if the effective use of technology may be a factor in engaging students in learning that increases the academic knowledge and skills necessary for higher achievement on the SAT.

A high grade point average in high school may be considered an indicator of students' college preparedness. Throughout high schools in the United States, there exists a range of grading standards and varying levels of academic rigor that can alter the playing field for the thousands of students applying for college in any given year. For the past eighty years, the College Board has administered the SAT and SAT subject tests during high school students' junior or senior year. Students complete the entire test by hand over the course of four hours. The SAT, designed to evaluate students' academic readiness for college, is "the benchmark standardized assessment of the critical reading and mathematical reasoning and writing skills students have developed over time" (http://professionals.collegboard.com/ testing/sat, 2 ). This nationally standardized test is divided into three sections: Critical Reading, Mathematics and Writing, with 800 being the highest score in each category, thus
comprising a maximum score of 2400. In 2010, students' average scores were 501 for Critical Reading, 516 for Mathematics and 497 for Writing. In 2004, the year in which this study was conducted, average scores were 508 for Critical Reading and 518 for Math (The College Board, 2011). The Writing component had not yet been implemented. Therefore, for the purposes of this study, we are reporting on the Critical Reading and Mathematics portion of the exam, which have a maximum combined score of 1600 .

## Perspectives

A review of the literature shows that students' engagement in challenging high school courses puts them on a path toward greater opportunities for learning, academic excellence, and higher SAT scores. Everson and Millsap (2004) acquired data from the College Board SAT questionnaire and students' scores on the SAT. Using a multi-level structural equation model, they found that students' SAT scores were affected by multiple variables including course taking opportunities and academic achievement. These findings were consistent when the researchers accounted for gender, race and ethnicity (Everson \& Millsap, 2004). In a qualitative comparative case study of 23 female high school students, O'Shea, Heilbronner and Reis (2010) found students scored particular well on the mathematics portion of the SAT when educators provided them with challenging and creative activities and exhibited high expectations. Participants stated that challenging curricula and high quality teachers provided a key to success in their mathematics achievement. Ghaznave, Keikha and Yaghoubi (2011) found that using technology to communicate and share information within the context of school curricular improves students' motivation, questioning skills, and research spirit, and consequently improves students' curricular scores.

The studies point to the connection of a challenging and innovative learning experience to academic achievement reflected by high grades and test scores (Everson \& Millsap, 2004; O'Shea, Helbronner \& Reis, 2010). The additional implementation of educational technology may strengthen that experience (Ghaznave, Keeikha \& Yaghoubi, 2011). In the qualitative portion of a mixed method study, Mouza (2008) found the most motivating educational soft-
ware among fourth grade children was Inspiration, Microsoft PowerPoint, and Timeliner. Students claimed they enjoyed the creative aspect of design and were excited to share their creations with classmates. Ross, Morrison and Lowther (2010) state that "Educational technology is not a homogenous 'intervention' but a broad variety of modalities, tools, and strategies for learning" (p. 19). Their study found that the effective use of technology requires access, training and proper use of all of the technological modalities in an academic setting, such as high schools. Specifically, technology should be used for sharing, disseminating and synthesizing knowledge. A meta analysis of over 500 individual research studies concluded that when students were in involved in computer based instruction (CBI), they scored at the 64th percentile on tests of achievement while students that did not have access to the CBI scored in the 50th percentile (Tamim, Bernard, Borokhovski, Abrami, \& Schmid, 2011). Schacter (1999) concluded that "by paying attention to the learner, the learning environment, professional competency, system capacity, community connections, technology capacity, and accountability, technology will be kept in service to learning" (p. 10). The effective use of technology, with an emphasis on the learner, and accountability of the teacher, is instrumental in educational and technological integration.

## Methodology

The purpose of this study was to determine whether seven indicators of high school computer use spreadsheet, general computer use, advanced word processing, share information, PowerPoint, basic word processing, and ethical use of computers - could predict SAT performance. SAT performance is divided into three groups: less than 960, 960-1080, and greater than 1080.

## Research Question

Does the self-reported use of educational technology in high school by recent high school graduates enrolled in college predict a level of achievement in their SAT scores?

## Setting

This study took place at a four-year liberal arts college located on Long Island, in New York. The college has a School of Education, School of Business and School of Liberal Arts. Subjects $(\mathrm{N}=133)$ in this study had graduated from high school during the years 2001-2004. Forty percent of the participants were males. Sixty three percent were Caucasians and $37 \%$ were minorities (Brachio, 2005).

## Method

Participants were given a survey that included ten demographic questions and 40 items that measured the seven indicators on a five-point Likert scale. The 40 items were selected after a factor analysis was performed on 65 original items. A principal component extraction with a varimax rotation accounted for the seven indicators (defined below). Internal consistency (Alpha) coefficients were calculated and are reported in Table 1 (Brachio, 2005).

| Table 1Dimension - High School ET Variables <br> After Factor Analysis |  |  |
| :--- | :---: | :---: |
| Dimension | Range | Alpha |
| Spreadsheet | $7-25$ | 0.89 |
| General Computer Use | $8-40$ | 0.89 |
| Advanced Word Processing | $6-30$ | 0.84 |
| Share Information | $6-30$ | 0.85 |
| PowerPoint Presentations | $6-30$ | 0.82 |
| Basic Word Processing | $4-20$ | 0.73 |
| Ethical Use of Computers | $3-15$ | 0.67 |
| (Brachio, 2005, p. 57) |  |  |

## The seven dimensions are defined as follows:

Spreadsheets - a student's ability to create graphs, make charts, format cells in a spreadsheet, demonstrate spreadsheet skills, can input formulas into cells in a spreadsheet, sort rows of cells, use the insert command and place graphics into a document.

General Computer Use - a student's ability to access emails, send emails, use search engines, write a multipage document, open a computer program, quit a computer program, form a page using bullets and numbering, and a familiarity with basic computer components.

Advanced Word Processing - a student's distinct ability to know the difference between a draw document and a word processing document, the ability to format a document using page numbers, group images, format a page using tabs and margins, create a text box in a draw document, and avoid spreading computer viruses.

Share Information - a student's ability to send emails with attached files, use online thesaurus, demonstrate general computer use skills, demonstrate word processing skills, open more than one browser window at a time and toggle between them, and copy information from one email, paste it into a new message and send it.

PowerPoint Presentation - a student's familiarity with basic tools in a draw document, can create a basic slide presentation with text and graphics, can use different text styles, can rearrange the slides in a presentation, can create a presentation that is presented manually or automatically and add visual effects to the slides in a presentation.

Basic Word Processing - students know the difference between "save" and "save as", students can use the help menu on programs, set the desired print range, and resize an image.

Ethical Use of Computers - students report that they respect the rights of copyright owners, do not use the school system to access material that is profane or obscene and do not try to bypass content filtering systems (Brachio, 2005).

SAT score ranges displayed in Table 2 were normally distributed into 20 percentile brackets. Ten (7.5\%) participants reported scores less than 820, 33 (34.6\%) reported scores between 821 and 960, 61 (45.5\%) reported scores between 961 and 1080, 22 (16.4\%) reported scores between 1081 and 1220, and seven (5.2\%) reported scores greater than 1221. Three groups of SAT scores, low (less than 960), medium (960-1080), and high (greater than 1080), were created to compare participants (Brachio, 2005). (In 2004, the SAT medium score was 1026).

| Table 2 |  |  |  |
| :--- | :---: | :---: | :---: |
| SAT Score - Frequency Distribution |  |  |  |
| SAT Score | Frequency | Percent |  |
| $1 .<960$ | 43 | 32.1 |  |
| $2.960-1080$ | 61 | 45.5 |  |
| $3 .>1080$ | 29 | 21.6 |  |
|  |  |  |  |

## Results

A discriminant analysis was conducted to determine whether seven indicators of high school computer use spreadsheet, general computer use, advanced word processing, share information, PowerPoint, basic word processing, and ethical use of computers - could predict SAT performance. Descriptive statistics representing the three SAT groups as described in Table 2 are displayed in Table 3.

When the mean values among the three groups are contrasted, major differences can be observed between Group 1 and Groups 2 and 3 in the dimensions of ability to share information, the use of PowerPoint and spreadsheet knowledge. To analyze the significance Wilks' Lambda and Eigenvalues were calculated.

The output for significance tests and strength-of-relationship statistics for the discriminant analysis are shown in Table 4 and Table 5.

Table 4 shows the overall Wilks' Lambda was approaching significance, $\Lambda=.81, \mathrm{X}^{2}(14, \mathrm{~N}=133)=$ $22.70, \rho=.065$ indicating that overall the indicators differentiated among the three SAT performance groups. In addition, the residual Wilks' lambda was not significant, $\Lambda=.92, \mathrm{X}^{2}(6, \mathrm{~N}=133)$ $=9.26, \rho=.160$. This test indicated that the indicators were not differentiated significantly among the three SAT performance groups after partialling out the effects of the first discriminant function. Because only the first test was most likely to be significant, the first discriminant function was chosen to be interpreted.

| Table 3 |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: |
|  |  | M | SD | Valid N |
| 1. < 960 | Spreadsheet | 21.94 | 8.63 | 33 |
|  | General Computer Use | 29.30 | 6.55 | 33 |
|  | Advanced Word Processing | 20.97 | 6.89 | 33 |
|  | Share Information | 23.30 | 7.00 | 33 |
|  | PowerPoint | 20.61 | 7.30 | 33 |
|  | Basic Word Processing | 15.70 | 4.74 | 33 |
|  | Ethical Computer Use | 11.64 | 3.29 | 33 |
| 2. 960-1080 | Spreadsheet | 23.00 | 7.54 | 56 |
|  | General Computer Use | 29.48 | 6.50 | 56 |
|  | Advanced Word Processing | 21.39 | 6.36 | 56 |
|  | Share Information | 24.98 | 6.04 | 56 |
|  | PowerPoint | 21.91 | 6.41 | 56 |
|  | Basic Word Processing | 15.45 | 4.58 | 56 |
|  | Ethical Computer Use | 12.04 | 2.82 | 56 |
| 3. $>1080$ | Spreadsheet | 26.42 | 7.96 | 26 |
|  | General Computer Use | 32.54 | 3.25 | 26 |
|  | Advanced Word Processing | 24.27 | 6.80 | 26 |
|  | Share Information | 26.51 | 5.43 | 26 |
|  | PowerPoint | 24.39 | 6.52 | 26 |
|  | Basic Word Processing | 16.85 | 3.82 | 26 |
|  | Ethical Computer Use | 11.92 | 3.70 | 26 |
| Total | Spreadsheet | 23.47 | 8.07 | 115 |
|  | General Computer Use | 30.13 | 6.04 | 115 |
|  | Advanced Word Processing | 21.93 | 6.68 | 115 |
|  | Share Information | 24.85 | 6.26 | 115 |
|  | PowerPoint | 22.10 | 6.78 | 115 |
|  | Basic Word Processing | 15.83 | 4.47 | 115 |
|  | Ethical Computer Use | 11.90 | 3.15 | 115 |


| Table 4 Wilks' Lambda |  |  |  |  |  |  |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: |
| Test of Function(s) | Wilks' Lambda | Chi-square | $\boldsymbol{d f}$ | $\boldsymbol{p}$ |  |  |
| 1 versus 2 and 3 | 0.812 | 22.704 | 14 | 0.065 |  |  |
| 2 versus 3 | 0.919 | 9.259 | 6 | 0.160 |  |  |

Table 5 shows that the first discriminant function revealed a relationship approaching significance between groups and all indicators, accounting for $12 \%$ of between group variability.

Table 6 displays the within-group correlations between the indicators and the discriminant function as well as the standardized weights. Based on these coefficients, the ability to share information (2.38), the use of PowerPoint (.960), and spreadsheet knowledge (.207) in high school demonstrate the strongest relationship with the discriminant function, while general computer usage and basic word processing in high school show a weaker relationship. When we tried to predict SAT performance, we were able to classify correctly $48 \%$ of the participants in our sample. To assess how well the classification procedure would predict in a new sample, we estimated the percent of students accurately classified by the leave-one-out technique and correctly classified $37 \%$ of the cases.

## The Importance of Technology in Raising Achievement

The SAT is the standard for college preparedness. If our goal is to empower every student with the opportunity for higher education, then we need to provide them with the tools necessary for success on the college boards. This study found that sharing information is one way the use of technology may lead to higher SAT scores. Information and communication technology has become a way of life for many of our students. While we may take for granted that they are the digital natives and can navigate within social networks, we cannot assume their technological socializing will lead to higher order thinking. Using communicative technologies effectively within the context of the classroom creates an enthusiasm for learning that leads to high achievement (Ghaznave, Keikha \& Yaghoubi, 2011).

| Table 5 Eigenvalues |  |  |  |  |  |
| :--- | :---: | :---: | :---: | :---: | :---: |
| Function | Eigenvalue | \% of Variance | Cumulative \% | Canonical <br> Correlation |  |
| 1 versus 2 and 3 | $.131^{\mathrm{a}}$ | 59.7 | 59.7 | 0.341 |  |
| 2 versus 3 | $.089^{\mathrm{a}}$ | 40.3 | 100 | 0.285 |  |

a. First 2 canonical discriminant functions were used in the analysis.

In addition to sharing information, this study also found that the use of PowerPoint and spreadsheets correlated to higher SAT scores. PowerPoint, Excel spreadsheets and other presentation programs enable students to synthesize their learning and actually teach it to others. These skills could begin development as early as grade school (Mouza, 2008) with a myriad of organizing and presentation programs that are right for any age. The key is that students are the creators, designers and teachers. As they advance into high school, and their technological expertise becomes more sophisticated, skilled educators may guide students toward using these presentation modalities as a strategy for learning (Ross, Morrison \& Lowther, 2010).

Student engagement is an important precursor to achievement, and students' proficiency in using computer based programs to facilitate sharing and presenting information creates an engaging learning environment. It is within this culture for learning that students may gain the thinking and problem solving skills necessary for higher achievement on the SAT and beyond. This study shows that there is a correlation between technology preparedness and achievement. This technologyachievement connection deserves closer attention as we advance through the 21st century.

Table 6 Standardized Coefficients and Correlations of Predictor Variables with the Discriminant Function

|  | Correlation coefficients with <br> discriminant functions | Standardized coefficients for <br> discriminant function |
| :--- | :---: | :---: |
| Spreadsheet | $\mathbf{0 . 2 0 4}$ | $\mathbf{0 . 2 0 7}$ |
| General Computer Use | 0.087 | -0.559 |
| Advanced Word Processing | 0.120 | -0.901 |
| Share Information | $\mathbf{0 . 3 5 4}$ | $\mathbf{2 . 2 3 8}$ |
| PowerPoint | $\mathbf{0 . 2 7 4}$ | $\mathbf{0 . 9 6 0}$ |
| Basic Word Processing | -0.038 | -1.769 |
| Ethical Computer Use | 0.150 | -0.049 |

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## Introduction

The purpose of this study is to review a small sample of the literature relating to the Common Core State Standards and perform a content analysis of the themes that emerge. Since its adoption by many states in 2010, there has been much written regarding the implications of national standards. Currently, all but two states, Texas and Alaska, have adopted the standards (Phillips \& Wong, 2010). The first evident theme in the literature was the foundation of the Common Core. This theme produced the most conflicts within the literature. Some researchers regarded the foundation as weak, and cited a lack of properly aligned assessments. Others touted the strengths of the foundation, and referenced high-performing states and countries as the model for the proposed standards. The second theme that emerged is that rigor, with respect to content objectives, fails to be definable in any satisfying terms. The final emergent theme was optimism that the Common Core initiative, if properly interpreted and supported, will have great impact.

## A Review of the Literature

Philips and Wong (2010) began their study by establishing educational credibility and providing a justification for their authority on evaluating the Common Core Standards (CCS). The authors have long and diverse careers in education and educational administration and have experience reforming standards. Their content analysis of the CCS revealed the theme of "fewer, clearer, higher" ( $p$. 38). They noted that there were fewer learning goals, but those that were adopted were more rich in depth and application; the topics had clearer learning objectives and continuity, and higher demand for quality work. Philips and Wong stated that assessments will need to radically change in order for this new paradigm to be successful. This theme calling for new assessments is echoed in much of the literature relating to the CCS (ie. Cizek, 2010; Porter, McMaken, Hwang, \& Yang, Common core standards: The new U.S. intended curriculum, 2011).

Philips and Wong (2010) offered that states develop formative assessments and methods of data-collection to ultimately aid teachers in improving their instruction thus producing more college-ready students. Contrary to this viewpoint, Porter, McMaken, Hwang, and Yang
(Assessing the common core standards: Opportunities for improving measures of instruction, 2011) found no evidence that the CCS is aiming for college-readiness.

Philips and Wong pointed out the folly that most states rely on a single assessment as a gauge of student achievement and teacher performance. This article, like most articles other than Wu (2011), failed to produce any specific examples of what Common Core lessons might actually look like. The authors succeeded in presenting a broad introduction to the goals of the Common Core, especially college-readiness, but left out the substantive material they promised to deliver to our students.

Cizek (2010) elaborated on the expressed need by Philips and Wong for well-aligned assessment tools. He outlined the major components that contribute to creating such assessments, and asserted that content standards are the antecedent to the assessment development process. Cizek took the position that there exists sufficient literature extolling the benefits of the Common Core. He addressed seven challenges the CCS could face in the near future. He made reference to the void of exemplar assessments aligned to the Common Core. This appears to be the first obstacle teachers will face, although the author does not list it as a major challenge.

The first major challenge Cizek offered was based on the idea that by broadening the scope of the standards, in terms of nationalizing the CCS, the curriculum could be "wa-tered-down." He based this fear on the principle that in order to see the same percentages passing in school, the bar for passing could be lowered, and this would be harmful to all stakeholders in education.

Cizek's second concern was a matter of inclusion. He wondered how the Common Core assessments will accommodate those who have limited English language proficiency or those with special needs. His third challenge was not as strongly supported as the previous. He expressed concern over the content changing frequently thus causing confusion. If implemented correctly, there will be no need to change the content objectives as often as Cizek suggests.

Next, Cizek described the issue of assessment innovation. He referred to the fact that any state may add additional content to the Common Core assessments, up to $15 \%$. This will allow for some flexibility and innovation, but Cizek carefully measured the benefits and costs of such additions and he is hard pressed to find a feasible reason in support of supplementing the assessments.

With a radical shift in assessment comes the challenge of meaningful and accurate validation. This is a theme that is developed further by Porter, McMaken, Hwang, \& Yang, in their article, Assessing the Common Core Standards: Opportunities for Improving Measures of Instruction (2011). The paper's penultimate challenge was perhaps the most optimistic. Teachers need formative assessments that accurately measure student progress toward the content and performance objectives. Cizek referenced several citations that report the amount of resources dedicated to this worthwhile endeavor. The final challenge was presented with the most urgency: The void of accountability measures taken to ensure the success of the system.

This article makes an important contribution to the growing body of literature regarding the assessments that will result from the Common Core. Cizek offered a focused, realistic discussion of the challenges that will arise in the coming years and supports his claims with evidence. Related, yet outside the scope of this study, is the theory that 21st century skills cannot be assessed using traditional methods (see Kyllonen, 2012).

Porter, McMaken, Hwang, and Yang (Assessing the Common Core Standards: Opportunities for Improving Measures of Instruction, 2011) began their article with an overview of the several organizations behind the development of the Common Core. They presented four potential benefits of the Common Core: Shared expectations from state to state, focused content similar to that used in high-performing countries, efficiency of material development and implementation across the nation, and improved assessments that may incorporate technology. The purpose of their study was a statistics-based analysis of the similarities and differences among the current state standards, the National Council of Teachers of Mathematics (NCTM) Standards, and the Common Core Standards.

The researchers used a valid and reliable method of statistical analysis known as the Surveys of Enacted Curriculum (SEC) method to compare assessments and generate an alignment index. This index compared each item of an assessment and took into account both content, and cognitive skills necessary to complete the item. A number was calculated that represented the proportion of consistency among the two tests. For example, if two identical exams were analyzed, the index would be 1.

Previous results cited by the authors indicated moderate alignment of state standards to state assessments, and low to moderate when individual states are compared for content alignment. Preliminary results of a
comparison between state standards and Common Core produced low alignment, namely .25 for Math and .30 for English. The authors suggested that this may be due to the fact that content may have shifted from one grade to another.

The solution was to aggregate the content across several grades and recalculate. The subsequent result showed improvement: Math rose to .41 and English rose to .52. The authors admonished that this is still not a high alignment. The reason for this (in mathematics) may be in the shift in focus to higher cognitive demand by the CCS. Memorization and algorithm reproduction are replaced by solving nonroutine problems. Less emphasis is placed on instructional technology, such as calculator use, as well. In English, the shift goes from generating to analyzing literature.

A surprising result comes from the analysis of the focus of the CCS. The researchers made reference to claims that state standards require more focus, comparable to internationally successful programs. However, when analyzed, on average the state standards were slightly more focused than the CCS. The researchers cited the degree of variability between states as the cause for this result.

Similar to Wu (2011), the issue of rigor was briefly discussed. Porter et al. agreed with Wu's assertion that the definition of rigor is ambiguous in the current standards, but where Wu seems to have implied the CCS will improve mathematical rigor, Porter et al. were dubious. They supported this doubt with evidence that the CCS shift focus away from advanced algebra and advanced geometry concepts in favor of fundamental skills and divergent problem solving. I, however, am not convinced by the literature that rigor necessarily means more advanced material.

The next analysis performed by the authors was a brief comparative study benchmarking the CCS to Massachusetts state standards. Massachusetts is the topperforming state on the National Assessment of Educational Progress (NAEP). For a further narrowing of focus, they only looked at alignment in grade 7. Their results were not surprising and for the most part, the previously stated shifts that emerged for the nation were true for this particular state. According to the authors, one of the explicit goals of the mathematics CCS is to prepare U.S. students to better compete with the high-performing countries such as Finland, Japan, and Singapore. When Grade 8 was indexed against the Common Core, these three countries aligned at the $.21, .17$, and .13 levels respectively. All three of these proportions are below the mean state alignment to the CCS. This suggests that the U.S. curriculum is more similar to the CCS already than these other countries. The logical question is whether or not the CCS will be able to accomplish the goal of international competition. Porter et al. continued to note the differences between the CCS and the curricula of the high-performing countries. One difference was that the CCS will place much more emphasis on non-routine problem solving. The article failed to support a rationale for this.

The authors concluded from their studies that the Common Core Standards are different from the currently and previously enacted state standards, and different from the standards of high-performing nations. Thus, it is difficult to predict long-term outcomes without speculation. However, while little can be said about content specifically, the data supported conclusively that the CCS will work towards higher cognitive demand. This alone is worth pursuing.

In a follow up article, Porter, McMaken, Hwang, and Yang (Common Core Standards: The New U.S. Intended Curriculum, 2011) responded to the comments of two opinions that resulted from their previous article. They summarized their previous findings, especially the intriguing result that neither high-performing countries, nor states, nor national standards had high alignment with the Common Core Standards. The authors addressed the criticisms that quality is hard to define, and that the success of the CCS will rely heavily on the quality of implementation. Again, the notion of rigor surfaced when the authors reassert the lack of valid and replicable measures of rigor in mathematics and English courses.

The researchers responded affirmatively to all of the criticisms that are referenced from the two pieces. They were in agreement with the respondents regarding a need for development in the areas of assessments, instructional materials, teacher education, valid and reliable measures of learning progressions, conceptions and measures of rigor, and applications to 21st century culture.

In his authoritative yet scathing analysis, Donald Orlich (2011) warned readers of the vague underpinnings of the Common Core State Standards initiative. He illustrated that it is often the case that rather than field-testing the efficacy of a standards-based education reform strategy, the standards are developed by committees and go straight to the implementation phase. This is perhaps a logical reason for previous failed attempts to increase school success by the standards-based initiative du jour. Thus, the author admonished those in education to beware that the Common Core State Standards follow this type of foundation and therefore is destined to fail. He substantiated his position by illustrating how the language of the standards essentially reduces the students to mere objects that either perform a given task or fail to do so. In other words, a high emphasis on standardized education and testing has a dehumanizing effect on the students and the overall structure of the educational system. The notion that one hundred percent of students can achieve one hundred percent of learning standards ignores important factors such as context, culture, and prerequisite skills and capabilities. Orlich provided a dozen or so examples of actual state standards and commented on their lack of continuity. His main point is that none of the state standards documents have a strong basis in empirically demonstrated piloting prior to implementation.

His article begs the question, why then, would the Common Core State Standards be the silver bullet? The author reported that there is minimal evidence that the

Common Core State Standards will improve our current public education system. Following his analysis of the continuity of the standards, Orlich examined the standards from a cogni-tive-developmental viewpoint. He used Piaget's theory of cognitive levels to determine the appropriateness of the scope and sequencing of state standards. His results were that many nine- and ten-year-olds were still in the concrete operational stage, while the standards demanded thinking at the formal stage. He followed this discussion by presenting the percentage of students at various levels of mathematical ability in 1978, 1996, and 2008. This was to make the point that although some significant progress exists in some areas, it is clear that the percentage of seventeen-year-olds thinking at the highest level is lower than it should be. Using developmental psychology, the standards could be more achievable and lasting (Orlich, 2011).

On the other hand, Catherine Gewertz (2012) centered her article around the firm foundation of the Common Core State Standards. The author described the basis of the Common Core as "informed" by international models. Nowhere in his article did Orlich mention international stan-dards-based systems as a source for the Common Core State Standards. Gewertz began her article by summarizing what aspects of high-performing countries can be recognized in the Common Core State Standards. Examples that she mentioned are a shift from wide-shallow to nar-row-deep topic development, de-emphasizing distracting topics such as data collection, and constructing evidencebased persuasive essays. She cited that countries such as Singapore, Japan, Canada, New Zealand, Finland and Australia follow the aforementioned trends. She further made mention of models from higher-performing states such as Massachusetts, California, Florida and Minnesota.

After discussing some hallmarks of high-performing countries, the author took a more holistic view and made the point that these facets may not actually be the cause for increased performance. She argued that there are indeed myriad variables that make an educational system successful and that care must be taken to regard the system as a whole and not merely its components. This demonstrated some weakness in the international comparative that for a moment agreed with Orlich. In the end, Gewertz takes the position that although the developers of the Common Core State Standards took many cues from successful systems abroad, a complex road still lies ahead to transition the United States to an effective, rigorous, and realistic national curriculum (Gewertz, 2012).

With the exception of Orlich, much of the literature regarding the implementation of the Common Core Standards is full of optimism. Wu's (2011) article contains cautious optimism. Wu began his discourse with a look at the current state of mathematics curricula. He did this through the lens of the high school textbooks that are widely used in the United States, referring to the current standards as Textbook School Mathematics (TSM). One of his initial contentions was that textbooks are the basis of the content that is taught in the classroom, and those textbooks lack precision
and logical reasoning. In fact, he referred to a study that showed most textbooks have errors on every other page or so. He also illuminated a misconception in the pre-CCS standards. The notion of rigor seems contingent upon timing rather than content. This is an interesting point. The current standards present that learning 8th grade topics in 7th grade forms a rigorous mathematics education. This ignores the amount of depth to which a topic can be studied in favor of getting through the chapters of the textbook earlier. He concluded that in the USA, commonly used math textbooks are erroneous and the topics lack continuity.

Wu has set the stage for the hero to enter and save Nell from the train tracks. The Common Core Standards will be the remedy to these problems. He noted the CCSMS place high value on consistency of topics, fluency with the language and rules of arithmetic, precision and logical reasoning. In other words, the CCS are everything that school mathematics should be, but repeatedly have fallen short of. Wu deftly illustrated the difference between TSM and CCS by using a concrete example from elementary school math: the addition of fractions. The TSM method lacks explanation of its logical underpinnings and is presented as a gimmick. On the other hand, the CCS method builds seamlessly on prior fundamental topics and has visual representations to validate its rationale. Wu followed up with a discussion of multiplication of negative numbers, a middle school topic that is problematic and incomplete under the TSM.

After his assault on textbooks, Wu recast college teacher preparation programs in the villainous role. He argued that the whole paradigm of teacher education needs to be rethought. His main point was that most programs teach university-level mathematics to mathematics education majors in hopes of a trickle-down effect. The flaw lies in the absence of addressing children's mathematical thought at the levels they will be teaching. He elucidated that most mathematicians avoid teaching mathematics pedagogy courses because they view them as trivial. The result of this is that mathematics education professors teach these courses, thus perpetuating the methods of TSM.

The final part of Wu's article outlined his solution for the future of mathematics education. It hinged on the notion of developing "mathematics engineers." Mathematics engineers adhere to the five core principles of mathematics education: precise definitions are the basis for logical deductions; precise statements clarify what is known and what is not known; every assertion can be backed by logical reasoning; all the concepts and skills are woven together like a tapestry; and each concept and skill has a purpose.

## Conclusion

It is well-supported that the goals of the Common Core are worth pursuing, and have potential for outstanding results (e.g. Wu, 2011). Yet much of the success is contingent upon proper assessments (Cizek, 2010; Kyllonen, 2012), and implementation by teachers (Porter, McMaken, Hwang, \& Yang, Assessing the Common Core Standards:

Opportunities for Improving Measures of Instruction, 2011). The illuminating work of Porter et al. quashes a prevalent preheld notion that the CCS are based heavily on top-performing countries such as Finland and Singapore (Porter, McMaken, Hwang, \& Yang, Common Core Standards: The New U.S. Intended Curriculum, 2011).

It is evident that much more development is needed in all areas. Retired Naval commander and author Richard Marcinko (1996) made the timeless observation: "Change hurts. It makes people insecure, confused, and angry. People want things to be the same as they've always been, because that makes life easier. But, if you're a leader, you can't let your people hang on to the past." (p. 37). Illustrative examples, such as those provided by Wu , serve to pique my optimism behind this movement and it is my hope that all teachers that read this material will respond similarly to this call to arms. I commend the authors for this inspiring battle-cry. Without such backing of those in the trenches, what hope do we have?

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## From the Field

# "Paradise Lost" In High School: What Was I Thinking? 

By Christina Windhorst, BA, MSE

I received a long-term replacement substitute assignment after being released from my position as part of a staff reduction because of cuts in state aid from my job as an English teacher at the end of the previous school year, June 2011. Well, at least I have a good job for a few months, I thought, and more importantly, I'll be working with students again.

As I contemplated the 12th grade curriculum, I thought that never in a million years would the 68 students in my two 12th grade sections comprehend John Milton's "Paradise Lost". I barely understood it in high school myself and it wasn't until an upper level Literature course in college that I grasped what Milton wanted readers to experience. I was hesitant. I felt that my students, from diverse cultural backgrounds and economically challenged lives, would not "get it". However, the curriculum called for them to study Paradise Lost. Perhaps, my lack of confidence and the diversity of my students made me rethink how literature should be approached in high school. I decided to delve deeply into the text myself. I have to admit that the McDougal Littell Literature Series, British Literature Edition was most helpful and gave wonderful resources. I did refer to it throughout the "Milton Unit".

My first action was to divide the class into learning groups, 3-4 students in each group each. Even groups work best because each student has a partner. I turned desks around to make squares and assigned students based on skill levels; strong writers to support weaker ones, high-level readers to support the ELL and ESL students. I also considered their personalities, as this was the 2 nd quarter, as I had come to know them. I used numbers to identify the groups. Letters or team names would work just as well.

The first class assignment was to discuss disappointment. What does it mean to be disappointed? Give examples of disappointments that we face. What we do when we experience disappointments?

I gave the students a prompt to write about a time that they experienced disappointment and to be prepared to discuss it. (I gave the students fair warning in case they wrote about something they did not want publicized). Students shared their experiences and we discussed how public figures (ranging from Michael Vick to Kim Kardashian) have handled disappointments. I let them speak and discuss public figures they selected, their disappointments and their embarrassments.

I had prepared a short, one page biography of Milton that included his loss of family and his early blindness. After studying his life, we read and discussed two sonnets and students began to be familiar with Milton's style.

On day 4 , I felt students were ready to begin "Paradise Lost". I did preface their first experience with "Paradise Lost" with information and criticisms that addressed how highly regarded his work was and that college students studied it today. I reassured them that they now possessed the skills and prior knowledge to really understand and enjoy his work.

I explained that at first, Milton would ask the muse for inspiration and within the first 25 lines would explain the two reasons why he is writing the epic. I told the students that it was their job to determine what those two reasons were. Giving the students a specific task seemed to be the "blast off point" (as I called it). They were intent on finding out the two reasons why he wrote this epic. With a little guidance (and the side notes in the text), students were able to point out and explain why Milton took on this task. Once they realized that they could do this the satisfaction showed on their faces and they were not about to stop at this point. I realized we all have a thirst for knowledge.

Day 5 began with the battle scene and the prompt for students was to determine why Satan does what Milton describes. Each consecutive day developed with
reading aloud sequential sections of "Paradise Lost" (sometimes I would read, but mostly, students read with emotion). Students began to get so excited about what they were reading. Sometimes, they called out comments about Satan or posed questions to one another. I encouraged them to play with ideas and insights and to have time to analyze events within their small group. There were times when students were still discussing the meaning and purpose of a particular passage as they left the room.

While all of this conversation is good, it does not demonstrate success if students are not able to put their thoughts to paper. I started their final assessment with four expository questions soliciting direct answers from the text.

Students responded well. Now it was time to take it to the next level; would students be able to synthesize their experience with "Paradise Lost" and relate it to their own lives? Could they write about "Paradise Lost" in their own voice?

I asked my students to discuss how pride affects humanity. They were required to select their own examples from the world of entertainment, sports, politics, and their own lives. Responses ranged from the current political climate to the high school's football
team with its $0-8$ record. It became clear that students did understand "Paradise Lost" and were able to relate Milton's ideas to their world and more importantly to themselves.

The final challenge I gave to my students was to write a comparison of Milton's work to other writers of that age. I choose John Donne's "Vindication of Weeping" and Shakespeare's "Sonnet 97". Student results ranged from high competency to mid-level competency with zero failures. I considered this successful learning. Obviously, when learning takes place, effective teaching happens.

I would change a few things going forward. I would add more cooperative assignments and more writing assignments relating to where we see good things happening in our world today. Did Milton reveal any good happening in his epic? I was truly amazed that students responded to Milton as well as they did. Students approached me to find a way to continue their studies of "Paradise Lost. " I may have to write a full semester curriculum that deals with "Great Books: Thinking, Sharing and Writing about Truth." What a thought!

Christina Windhorst, BA, MSE, is a Substitute Teacher in the Central IslipUFSD.


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[^0]:    ${ }^{1}$ ECLS-K data are also available for grade K, 1, 3, and 8 but these are not used in this paper.

[^1]:    ${ }^{2}$ The restricted-use ECLS-K data are used in this paper. The grade span information is not available in the public-use dataset. Because of confidentiality requirements associated with using NCES restricteduse data, all unweighted sample size numbers derived from the restricted data have been rounded to the nearest ten.

