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SCOPE Education Services is a not-for-profit, private, voluntary organization permanently chartered by the New York State Board of Regents to provide service to school districts. Founded in 1964 by school superintendents, it is a cooperative venture for sharing resources to deal with common concerns. It is governed by a Board of Directors of school superintendents and college representatives and serves as a regional School Study Council and School Board Institute.

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Future Themes for The Long Island Education Review:

Ethics In Education

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Editor's Perspective



LEADERSHIP FOR INNOVATION

When we consider our country's investment in public education we should , at the same time, consider what other countries are investing in their educational infrastructure to develop human capital. There has been a shift over the past two decades with the United States loosing preeminence in science and math achievement. Recently, the CEO of Intel pointed out that 50,000 American students participated in the International Science Competition (sponsored by Intel) while China had 6 million students participate in science fairs that led to their final competition.

Innovation, an important characteristic that has influenced American prosperity, is frequently fueled by creativity with science and math. Perhaps what we need is the equivalent of the Manhattan Project for education to generate an intense focus on both science and math, as it would serve our economy, our environment and our efforts to develop alternative energy. Unless we continue to be the country most able to innovate, our international influence will diminish. Leadership encouraging educational innovation, research and development is essential.

In this volume of the L.I. Education Review, contributors reflect on innovation, their research, collaboration and leadership qualities. Innovative teaching procedures, planning techniques, certification alternatives, and teacher preparation are addressed in *"Preparing Future Educators"*, *The Effects of Tactual Resources on Achievement in Science"*, *"Alternative Teacher Certification - A New Model"*, and *"Planning for students with Asperger's Syndrome"*.

Elsewhere leadership issues addressing integrity, ethical decision making, regional collaboration and systems that support successful staff development are illuminated (see "Ethical Challenges: Academic Integrity in Higher Education", "The Regional Council for Research and Practice" and "Three Essential Steps for Successful Staff Development").

In addition, three research studies focus on "Gender and Mathematics Ability", "Learning Style Based Homework Prescriptions", along with "A Case Study on Academic Mentoring at the Middle School Level".

Kevin N. McGuire.

Editor

OPINION CENTER

Three Essential Steps for Successful Staff Development: Applying Deming's System Theory

By Thomas F. Kelly, Ph.D.

There are more exciting educational innovations available to schools than ever before. Dozens of well conceived staff development programs are going on constantly. I recently heard a principal ask a disturbing question. "We trained all of our teachers in a well known staff development program three years ago, and almost none of it seems to be in place today. Why?" We hear this sort of thing far too often. Extensive training in well known and accepted programs shows little or no difference in terms of results in a year or two.

At a time when schools are intensely seeking ways to improve, boards of education are less and less willing to support staff development. Unfortunately this is understandable since countless staff development programs have been undertaken involving a great deal of money and effort with no measurable or demonstrable improvement to show for them.

As Deming (2000) has observed, consistent problems are structural or systemic. Our present staff development process is structurally flawed. It has failure built in. For staff development to have significant and lasting positive impact it must be structured to include three essential steps which must take place.

1) The need for staff development must be recognized by the staff to be trained.

Sending educators for training to improve instruction is based on the assumption that improvement is needed. If the staff to be trained does not see this need, there is virtually no chance for significant long term change as a result of such training. In the case cited above, the central office had mandated training in a well recognized program. Mandates, we are coming to learn, may bring a degree of compliance, but only commitment can bring excellence. The teachers all attended the sessions (i.e. compliance) but did not commit to implementing the training.

The best way to gain agreement of staff for the need for training is through skillful use of clear data.

2) Staff to be trained should choose the training program they want.

Even when staff see and agree upon the need for training, the success of staff development will be thwarted when someone else chooses which training program they will receive. Staff must not only recognize the need for training, but also recognize the training program most appropriate to meet their need. Both are necessary for commitment.

A small committee of staff can explore and gather options for the entire staff to review. Time must be taken to discuss options and develop consensus on which program is best. Without such consensus, school wide lasting change cannot result. (A practical definition of consensus is needed. Consensus means almost all of us. Some of us would not have agreed to being born if they had the choice at the time.)

3) All involved staff should go through the training together with leadership.

By experiencing the training together, a community of interest is formed. When we go back to the school to implement the new program, we can support and act as resources for each other.

It is also critical that all who supervise the program go through the training with the teachers. It makes no sense, for example, to train the whole elementary teaching staff in a new reading program and not the principal. Deming would not train a company unless leadership attended the training.

While these three steps require time and a great deal of staff involvement, taking them virtually guarantees successful lasting change as a result of staff development. The real challenge in staff development is to structure the process for success before it begins. Without these three steps (i. e. this structure), there will be little or no success.

For more on applications of Deming's systems theory to education see:

Deming, W. Edward (200). The New Economics for Industry, Government and Education.

Kelly, T. (1996). Practical strategies for school improvement (2nd Ed.). Wheeling, Illinois: National School Services. see http://www.n-s-s.com/index.htm http://www.n-s- then go to school improvement.

Kelly, T. Bridges and Tunnels and School Reform: It's the system Stupid. Manuscript in progress, 2008.

Dr. Thomas F. Kelly is Associate Professor of Educational Administration, Leadership and Technology at Dowling College, Oakdale, NY.

OPINION CENTER

Preparing Future Educators: the 21st Century Classroom - by Lori Cohen

Lucky are those who can turn their avocation into their vocation. I was lucky. In the fourth grade I devoured the entire Nancy Drew series, books purchased one at a time with my allowance, books that I still own and treasure. In middle school, emulating Anne Frank, I wrote in my diary faithfully, chronicling my life as well as the pulse of the world we were living in. Fortunately, I didn't have to endure a Holocaust like my idol, and I lived to share my journals with my students, particularly the entries that recorded Martin Luther King, Junior's assassination and the turmoil and commemorations that ensued. The history and English lessons of my diaries run the gamut from babysitting for fifty cents an hour, stressing about city-wide exams and report cards, to Robert Kennedy's assassination in June. The year-1968. My eighth grade Junior High School 231 Yearbook is dedicated to King, and my students are enthralled by the still relevant articles therein. This is only one of the thrills of teachingsharing our life experiences.

By the eighth grade it was etched in stone: I was going to be an English teacher. However, born in the 1950s to an Italian mother and a Jewish father who believed that a woman's place was in the home, pursuing my dream was no easy feat. But my passion for literature and my penchant for writing outweighed all the obstacles, and I managed to go to college and graduate school despite getting married at nineteen and becoming a mother at twenty-two. I got my feet wet substitute teaching, coaching, and teaching Adult Education, but my career as an educator really began in the Freeport Public Schools in 1981. After twenty-seven years teaching middle school and high school, I know what new teachers need to know before embarking on a similar journey.

Lesson Plans and Moral Education

It's certainly not all about lesson plans. Undoubtedly, teachers must be familiar with the state standards and performance indicators and incorporate them into their daily lessons. Nonetheless, although it is important to be prepared, a lesson plan is only an outline, a foundation. Teachers need to be flexible, keep an open mind, and have a good sense of humor. They should never waste a teacher moment because it isn't in their lesson plan. After all, "Life is what happens while you're busy making plans." As I reflect on the life of a teacher, I am reminded of a poem by Bruce Bennett entitled, "The Story of Your Life":

> Always a new wrinkle, A new corner/A new alley/A new twist To be revealed/To be explained

To be gone into... And it is endlessly Fascinating...

Teachers would be remiss if they did not incorporate life lessons into the curriculum. Whether examining history, current events, or literature, where there's a moral dilemma, ask the children what they would do in that situation.

Unfortunately, since the beginning of the 21st century, the number of hate groups has risen dramatically. A principal, who was also a Holocaust survivor, implored his teachers never to "produce learned monsters." He emphasized, "Reading, writing, and arithmetic are important only if they serve to make our children more human" (Lisa Kuhmerker, ed., *Moral Education Forum*, New York: Hunter College, CUNY, 1981, p. 4).

Technology and Effective Written Communication

Clearly, technology is useful and enhances instruction. But I'm not concerned with new teachers knowing how to use technology; young people are very tech savvy. However, technology should never take the place of content knowledge or the ability to write standard grammatically correct English with a simple pen and paper. Fine writing is becoming a lost art. In an age of text messaging and email, so many people today cannot communicate effectively in writing. **All** teachers have to make writing count—for themselves and for their students—regardless of the subject matter.

Interdisciplinary Planning and Instruction

Nothing should be taught in isolation. Tunnel vision is not productive. Making connections, either to current events, life experiences, or other content areas, insures long-term retention.

A good teacher should be willing to participate in interdisciplinary planning and instruction as well as become familiar with assessments in other content areas in order to foster academic success.

Test Prep and the Use of Performance Data

Educators are acutely aware of how much testing goes on since No Child Left Behind and the New York State Standards. People often complain that education has turned into test prep. It doesn't have to, nor should it, be that way. "Test prep" should always involve teaching the skills, not just going over answers to questions. It's also an opportunity to model exemplary student work, which the children love to see.

Statistics and performance data are barometers for effective instruction. Like the saying goes, "You can't know where you're going unless you know where you came from." All data should be used to drive instruction. Data should also come from more than one assessment. To get a more accurate picture, data should include information from preceding grades. As the year progresses and new data becomes available, it becomes a tool for measuring the progress of a child, a class, or an entire grade.

Item analyses are valuable for the teachers **and** the students. At my school, John W. Dodd Middle School, the students have their individual item analyses in front of them as we go over each test. They appreciate it when instructors share the class' results with them; they want to know which questions their classmates had trouble with too. We examine these results together to identify the skills and tasks those questions demanded. The students are empowered, take ownership of their data, and strive to improve. The teachers plan lessons based on the skills that tripped them up. It's win-win!

Using performance data also helps teachers create future assessments. Teachers should focus more on "why" than on "what." They should go back to Blooms' Taxonomy and use higher level test vocabulary to challenge the students—make them think and problem solve, not merely regurgitate facts.

Designing Assessments

Teachers need to design lessons and assessments that matter to the children. For example, when my students learn the art of persuasive writing, not only do they get to choose a topic that matters to them, but, upon completion, they also send their opinion pieces to local newspapers. Knowing that other people will be reading what they wrote and that their essays might get printed on the Opinion/ Editorial page in a local newspaper, make the finished product more meaningful. Consequently, they are meticulous, taking more pride in their work.

Differentiated Instruction

Upcoming teachers need to know what differentiated instruction is about. Quoting a line from *The Kite Runner*, "Children aren't coloring books; you don't get to fill them up with all your favorite colors."

Our classes, for the most part, are heterogeneous and include Students With Disabilities and English Language Learners. Since children do come in all shapes and sizes, what must a teacher do?

A teacher in California used a great metaphor for teachers, comparing us to tailors. Just as a tailor has to adjust the clothes to make them fit the individual, a teacher has to adjust the teaching tools to fit the individual students and accommodate different learning styles ("What is Your Metaphor for Teaching?" *Teaching Tolerance: A Project of the Southern Poverty Law Center*, Montgomery, Alabama, April 10, 2008).

I marvel at the resilience of the Japanese internees at Manzanar when they were given surplus military clothing that was not only unattractive but also much too big for them. According to Jeanne Wakatsuki's autobiography, *Farewell to Manzanar*, instead of whining, the internees hauled in sewing machines and altered the clothing to suit them. That's exactly what we, the teachers, have to do with the children in our charge.

Diversity and Tolerance

The 21st century classroom is also culturally and racially diverse. Proficiency in a foreign language, especially Spanish, is an asset. So is sensitivity.

What we deem unacceptable in this country might have been perfectly okay in their native countries. While we do have to teach them appropriate versus inappropriate, we should also embrace their heritage, share their food, their music, and their celebrations. The rewards are immeasurable. I owe my merengue skills to my students! My life has been enriched by attending many Quinceaneras, Sweet Sixteens, graduation parties, bridal and baby showers, and even a few weddings of my primarily Latino and African-American students. Similarly, as things arise in the Holocaust literature we teach in English while the children are studying World War II in social studies, I am able to share some of my own traditions, and my students are always respectfully inquisitive. For many years, Holocaust survivor friends of mine have come to speak to my Freeport children. The students' polite acceptance of the heavy accent and language difficulties of the guest speakers, as well as their respect and compassion for the subject matter as they learn about tolerance, is admirable and infectious.

Not so incidentally, in April of 2007, a *Newsday* reporter came to my classroom and wrote an article about Mrs. Irene Weiss, a survivor and author, coming to our school. The children were so excited that they chipped in to have the article framed for Mrs. Weiss.

Being a Role Model

More than anything else, teachers are role models for their students. The children notice everything we say, everything we do, and everything we wear. Even when there is no formal dress code, we must adopt one for ourselves. Children are very impressionable; they look up to us. Teachers command more respect and have better classroom management when they are dressed professionally.

Part of being a positive role model is demonstrating good habits like being an avid reader and a lifelong learner. When a teacher exudes fervor towards reading and gathering information, the children are excited too.

When stumped by an unanticipated question, a teacher should never feel inadequate saying, "I'll have to do some research and get back to you." In fact, it sets an example. Better yet, ask the children to do the research and bring it to the class. They love extra credit!

Work Ethic

It is a teacher's responsibility to exercise a good oldfashioned work ethic. There are so many things that go into keeping a school running. Educators should be prepared to jump in as needed even when it's not part of the job description. At Dodd, we refer to these details as "the things we never learned in college" or "the real deal." If future educators are embarking on this career because our responsibilities end at 3:00 and we get a lot of vacations, they need to rethink it!

New teachers, LISTEN and WATCH; you're the new kids on the block. Tap the brains and the resources of the veteran teachers and avail yourselves of official or unofficial mentoring. At the same time, be aware that, no matter how much experience one has, teaching is trial and error. We need to reflect daily on what we did right and what we could have done better. Like the children's essays, we are always works in progress.

The Benefits of Longevity and Getting Involved

It seems that teacher retention has become a serious issue. The trend for new teachers is to either bail out after a few years or district-hop. To help eliminate this problem, I encourage them to get involved outside the classroom—in the school and in the community. There are so many clubs, committees, and events in which to partake. It's a boon to the school and it also makes going to work more fun! My involvement on the School-to-Career Committee has contributed to the excitement of **my** career. Similarly, participating in the rededication of our school on its twentyfifth birthday was like making a party for a thousand people! Teaching SAT Prep, both in the after-school program and privately, has honed **my** skills and enlightened me as to what my students will need to get into college.

Throughout the years, mentoring students at risk has made each day a little more challenging as well. For example, a young girl, whose alcoholic mother walked out on the family the year she was in my class, latched on to me. I'll never forget our time together, especially the day when her father brought her to my home to escort my son to his eighth grade dance! On a very personal note, in 1991, the decision to become the legal guardian of one of my troubled students changed the dynamics of my whole family and impacted my life forever. He is now thirty-one years old, and I can't imagine a Thanksgiving without Brian at the table.

On the whole, teenagers are interesting individuals. Middle school children in particular, having one foot in the baby door and one foot in the grownup door, have made my years in the classroom fulfilling. Although they like to be treated as young adults, they still react enthusiastically to simple rewards like a "Super Student" pencil or an extra credit sticker for reading a novel independently.

Stay long enough to effect change and make a difference. Longevity is great! I'm living proof. It's a wonderful sense of belonging to know people everywhere I go in the Freeport Community. I'm never a stranger at a school function. I've experienced the comfort and the joy of having the brothers and sisters, and even the children, of former students. In the process of wading through a demanding curriculum and preening my students for the rigors of high school, I've developed ongoing relationships with many of them and their families. I can always count on a birthday card or a holiday card from one former student or another. Sometimes they even come to visit. When I had surgery a few years ago, Julissa, now in her late twenties, came to see me, payback for a time when a podiatrist friend of mine operated on her, gratis, because her family did not have health insurance.

The greatest rush comes from running into an old student who was positively influenced by my class. I ran into a forty-year-old librarian who recognized me and reminded me of a poetry and music lesson she loved when she was in my eighth grade class. She inspired me to revisit it and use it again. I met a grown man at a party who fondly remembers our trip to see *The Diary of Anne Frank* on stage. Often, I run into adults who say they will never forget reading *Night* by Elie Wiesel and meeting people who were in concentration camps. Last but not least, I get to reminisce with colleagues who were once my students. Neither swimming a mile nor briskly walking five has ever released the endorphins that these encounters have for me!

Keeping up with all the changes in public education, being the head of my department, and being the Teacher on Special Assignment to fulfill the requirements of the New York State Standards and Assessments, all have contributed to my remaining a lifelong learner and keeping my job at a feverish pitch. I can't watch a movie or read a book without contemplating how something about it might be turned into an English lesson. I still love the smell of a bookstore and can never leave without some new titles for my classroom library. It gives me great pleasure to witness the children gobbling them up and vying for "next" to read a particular book.

Longevity offers opportunities and privileges that newcomers don't get. Also, being in the Freeport School District since 1981 has afforded me the kind of friendships that make life worth living. There are a lot of rewards in this profession. For every day that knocks the wind out of your sails, there are fifty that nurture your spirit and make you want to persevere. At the end of each day I experience feelings of pride and productivity. I know I make a difference in the lives of my students and in my school.

Last but not least, longevity brought me the glory of being chosen by Long Island University and honored at the C.W. Post Commencement as the "Nassau County Secondary School Educator of the Year" this past spring. I thank Freeport Superintendent, Dr. Eric Eversley, Assistant Superintendent, Dr. Raymond McCloat, and Principal, Mr. John O' Mard for the nomination and for the confidence that allows me to be what I am to the Freeport School District. For the experiences of a career that spans three decades, I am forever grateful.

Lori Cohen is a Teacher at J.W. Dodd Middle School in Freeport, New York.



The purpose of this paper is to briefly summarize research findings on gender differences in mathematics learning and to relate them to nursing and nursing education. Success in mathematics is viewed as a "critical filter" for career development and professional achievement in an increasingly technological world (Fan & Chen, 1997; Hyde, et al., 1990).

There has been national concern about reported gender differences in mathematics performance and achievement since the 1970's. Analyses of school achievement, course-taking patterns, and standardized test data have uncovered patterns of gender differences in mathematics achievement and participation (AAUW, 1992; 1998; NSF, 2002).



Nursing is a profession in which approxi-

mately 95% of the practitioners are female (ANA, 2004). Nursing practice involves the ability to analyze and apply scientific principles, and these thinking skills have been connected to mathematical aptitude by Yess (as cited in Celestino, 1985). The consensus within the nursing profession is that nurses require basic and advanced mathematical skills in order to safely practice nursing (Allen, & Pappas, 1999; Cartwright, 1995; Hunt, 1982; Malecka, 1950; Pirie, 1987; Roberts, 1990). Because nursing is still a largely female profession, a discussion about mathematical ability of nurses and nursing students must include a review of the literature on gender and mathematics.

Educators and researchers have long noted gender differences in mathematical learning. Leder (1992) reported a total of 38 articles, which is approximately 10% of the total number of articles published in *The Journal for Research in Mathematics Education* between 1978 and 1990, which included gender concerns. These reports considered various aspects of the differences in mathematics learning and achievement between females and males. Broadly, two areas of gender disparity have been identified: performance and participation.

Performance

Fennema reported in a literature review in 1974 that "... there was evidence to support the idea that there were differences between girls' and boys' learning of mathematics, particularly in items that required complex reasoning; that the differences increased at about the onset of adolescence, and that these differences were recognized by many lead-

ing mathematics educators" (Fennema, 2002, ¶ 3). For example, in their study using data from the National Education Longitudinal Study of 1988 national sample, Fan and Chen (1997) reported that there were small gender differences in mathematics achievement when the number of students is taken as an aggregate. They did find substantial gender

differences in participation and performance in the higher-grade level mathematics courses. "Not only did the percentage of female students decrease from the 8th to the 12th grade, but also, as the score range became more extreme, gender difference increased ... At the extreme, that is, students who scored above the 95th percentile in 12th grade, male students outnumbered female students by 2:1" (Discussion section, ¶ 1-2).

Subsequent studies conducted in the 1980's further substantiated these conclusions. Specifically, males tended to outperform females on standardized tests of mathematical ability. Some of the variables identified that influenced this difference in achievement included the type of test administered, the age of the students, and differences between standardized test measurement and classroom tests (Leder, 1992). Although research findings conducted in the 1990's have disputed the meaning of the findings of earlier studies (AAUW, 1992; Hyde, et al., 1990; Leder, 1992), the AAUW 1998 report Gender Gaps: Where Schools Still Fail Our Children notes that "Scores on NAEP [The National Assessment of Educational Progress] reinforce traditional beliefs about girls' and boys' areas of relative strength: The highest scores in math, science, history, and geography are earned by boys, while girls earn the highest scores in reading and writing" (p. 3).

Participation

Gender differences in participation in mathematics courses once they are no longer compulsory have also been identified (AAUW, 1992; Fennema, 1993; Leder, 1992). Mathematics performance and participation are virtually the same for males and females from elementary through middle school. Up to the level of second year algebra there are no significant differences in the mathematics courses taken by 17year old males and females (Silver, 1988 as cited in Leder, 1992). Although recent NAEP data have noted that both male and female students took more advanced mathematics courses in 1994 than in 1982 (NSF, 2000), there are still reported gender differences in enrollment in upper level, college preparatory courses that are seen as essential to acquiring the foundation for further study of advanced mathematics (Campbell, 1995; Croom, 1997; Fennema, 1993; Leder, 1992). The disparity in mathematics course participation rates potentially has long-term consequences for females.

Theoretical Models

In an effort to understand the differences in performance and participation, a number of explanations and theoretical models have been proposed. The early research on gender and mathematics utilized a deficiency orientation theoretical model. "The deficiency orientation focuses on what we believe members of another group lack" (Sleeter & Grant, 2003, p. 42). Girls' lack of success in mathematics was attributed to deficiencies that exist within girls. In this context, the deficiency model postulates that innate biological factors are responsible for the research findings that indicate that boys display a more natural mathematical ability over girls. *Newsweek* highlighted this view in the December 15, 1980 headline "Do Males Have a Math Gene"? Girls were seen as naturally lacking mathematical ability as compared to boys.

In this tradition, mathematics was viewed as a masculine activity and women were not expected to participate beyond achieving basic numeracy (Singer & Stake, 1986). It had been generally accepted ".... that mathematics and science are male domains, that only people with 'mathematical minds', mostly men, can do mathematics, and that one cannot be good in both language arts and mathematics (with the corollary that women, held to be good in language arts, cannot also be good in mathematics" (Hanna, 2003, ¶ 5).

Intelligence and spatial abilities are two cognitive variables that have been investigated in some depth. Generally, interventions based on this model sought to change females to be more similar to males.

Research has not supported the premise that physical or intellectual barriers in women lead to the difference in their participation in mathematics and science. "Indeed, it is now generally accepted that women have been and continue to be underrepresented in these fields mainly because of social and cultural barriers that did not and still may not afford them equal opportunities" (Hanna, ¶ 7). In view of the preponderance of conflicting research results, educational researchers began to turn away from such biologically based gender stereotyping. Proponents of genetics as the cause of differences in mathematics ability have qualified their original claim: "Even though biological factors seem to be involved in determining the sex difference in mathematical reasoning ability, this does not imply that efforts at remediation cannot make a difference (Benbow, 1988, p. 182 as cited in Leder, 1992).

In 1983, national attention was drawn to the overall underachievement of American students (National Commission on Excellence in Education). The National Council of Teachers of Mathematics responded to these reports with the development of new curriculum and evaluation standards. which offered changes for improvements in mathematics education. "These changes are the principle components of a concerted effort to create equitable and high-quality learning opportunities for all students, including those groups whose achievement has been impeded because of social injustices in school practices and policies" (Croom, 1997, ¶ 2). The difference orientation theoretical model is more congruent to understanding and explicating gender differences in mathematics than the deficiency orientation model. Advocates of this model ". . . . believe that there are different models of healthy psychological development fostered by different cultural contexts or constitutional endowments. Rather than focusing on deficiencies that need to be remediated, advocates of the difference orientation focus on strengths to build on . . . " (Sleeter & Grant, p. 49).

Educators have sought ways to identify and achieve gender equity in mathematics. Research has revealed many factors that interact and contribute to inequities in mathematics learning. Strand and Mayfield call these a "hidden curriculum" (2002). These include environmental variables such as differential treatment in the classroom, favoring boys; teachers' lower expectations for girls' performance; negative affective internal belief variables; social stereotyping that perpetuates assumptions of female inferiority in mathematics; and the pedagogy of how mathematics is taught (Hanna, 2003; Leder, 1992; Strand & Mayfield, 2002).

Feminist researchers have embraced the premises of the difference orientation model because they are in accord with fundamental tenets of feminism and feministic pedagogy. "Feminist models recognize that gender is socially constructed and accept that differences are not biologically determined" (Becker, 2003, ¶ 2). Educational researchers have begun to regard the gender discrepancies in mathematics performance and participation to be a result of a prevailing social order that reflected an unintentional, often-unconscious gender discrimination" (Hanna, 2003). The difference orientation model supports these feministic ideals: "Girls do not bring to school less learning than boys; rather, they bring somewhat different learning. Nor are girls genetically inferior to boys in learning mathematics and science" (Sleeter & Grant, p. 56).

Currently, educational research has determined that gender differences in mathematics performance are small (Hyde, et al., 1990). However, "Research shows that gender differences related to ability in mathematics persist in girls' and boys' perceptions throughout their schooling. Females reported more often than males that they had less confidence in their ability to do mathematics and expressed feelings of dislike for the subject as they got older" (Croom, 1997; Hyde et al., 1990). This in turn likely contributes to the findings of gender differences in participation in mathematics courses.

How well high school students like their mathematics courses, how well they do in their mathematics courses, and whether or not they think of themselves as capable math learners are all critical determinants of which students are likely to persist through advanced-level mathematics courses, to enroll in mathematics courses in college, and ultimately to select college majors and careers in science and technological fields for which advanced mathematics courses are a basic requirement (Strand & Mayfield, 2002, p. 69)

Hyde et al. (1990) in their meta-analysis on mathematics attitude and affect documented that the "math as a male domain" persists, primarily among males.

We should be concerned about males' stereotyped views, which might lead male peers of female students to indicate in a variety of subtle ways that females who achieve in mathematics are somehow less feminine and thus put pressure on females not to achieve in mathematics. Such views might also lead male teachers to discourage girls from taking mathematics courses or might lead male employers or job interviewers to discourage female applicants for mathematics-related jobs (p. 310).

These patterns of socializing women away from mathematics and male bias regarding female success in mathematics may also influence women to self-select themselves out of mathematics and mathematics-related courses and as a result, face more limited career opportunities and options (Leder, 1992).

Gender, Mathematics and Nursing

In the highly technological health care settings today, the Registered nurse requires proficiency in both mathematical calculations and mathematical problem solving for responsible medication administration. However, the problems with mathematic achievement are widespread in the United States and the nationwide trend toward students' ability to learn mathematics has been a concern for educators for many years. Consequently, individuals entering nursing programs come with varying degrees of mathematical skills and attitudes toward mathematics. Ensuring competency in mathematical calculations continues to be a key concern for both nursing education and nursing service. Researchers have shown that practicing Registered nurses (Ashby, 1997; Bindler & Bayne, 1991; Bliss-Holtz, 1994; Conti & Beare, 1988; Haigh, 2002; Perlstein et al., 1979; Sabol, 1981) and nursing students (Bindler & Bayne, 1984; Blais, K. & Bath, J., 1992 Chenger et al., 1989; Dexter & Applegate, 1980; Gillham, 1995; Hek, 1994; Laverty, 1989; Pozehl, 1996; Ptaszynski & Silver, 1981; Segatore, Edge & Miller, 1993; Timpke & Janney, 1981; Worrell & Hodson, 1989) often have difficulty in performing necessary mathematical calculations.

In an editorial on mathematical calculation deficiencies within nursing in the *Journal of Nursing Education*, Eaton states "They [nursing students] fail to recognize incorrect (unrealistic and unsafe) answers that shine up at them from their calculators" (1989, p. 342). Pozehl found in her study that nursing students were more deficient in mathematical skills than their non-nursing counterparts (1996). Additionally, many nursing students have negative attitudes toward mathematics and low self-efficacy beliefs in their ability to solve problems (Eaton, 1989). This is of great concern because it leads to doubts as to nursing students' ability to safely administer medications and to eventually practice nursing.

The current critical nursing shortage and subsequent active recruitment of students into nursing programs creates student populations with varying mathematical calculation abilities. The American Nurses Association states "Students who wish to prepare for a nursing career should give particular attention to math . . . " (2004). But students planning on nursing as a career choice may not realize that both basic mathematics calculation and problem solving skills will be necessary for success in a nursing program. As a result, many may take only the limited mathematics courses required for high school graduation.

In conclusion, competency in mathematics has assumed a gate-keeping role for entrance into college and professional development. Research has demonstrated that mathematics' attitudes and affect are instrumental for successful mathematical achievement. Social stereotyping influences females' persistence in and attitudes about prerequisite ad-

Project SAVE - Fingerprinting

SCOPE offers fingerprinting services for Long Island school districts, under New York State's PROJECT SAVE Legislation. The law also applies to those working five or more days in any school building, such as substitutes, guest speakers, or outside consultants.

If you would like additional information, or to schedule an appointment to be fingerprinted, please call SCOPE, at (631) 360-0800, ext. 113. vanced mathematics courses and consequently, career opportunities. Nursing students are at least as challenged as other students. Although nursing has a tradition of being largely female, current nursing practice requires clinicians both female and male to demonstrate mathematical ability in order to deliver safe care. A better understanding of gender differences in mathematics will assist nursing educators to better prepare nursing students.

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The Regional Council for Research and Practice: A Long Island Educational Collaboration

- by Patrick B. Johnson, Albert Inserra and Jeanne Weber

Abstract

This paper describes a unique collaboration between three types of Long Island educational organizations: a Board of Cooperative Educational Services, a School of Education, and school districts. In this collaboration, graduate students enrolled in research courses in the school of education conduct their research projects to answer questions of interest to administrators from the school districts involved in the collaboration. In many instances, the data used to answer these questions was provided by the Regional Information Center, a data warehouse located at the Board of Cooperative Educational Services. The genesis of the collaboration is described and sample student projects are presented. While the benefits of the collaboration for each of the participating organizations are highlighted, limitations and constraints are also presented.

Introduction

The complexity of the American educational enterprise is reflected in the large number of groups and institutions involved either directly or indirectly with it. For example in addition to school districts and the schools residing in them, there are local and regional agencies providing services including after-school activities, academic support, legal, and evaluation assistance. Then, too, there are state and federal agencies charged with creating policies, providing funds, and insuring compliance with academic and nonacademic standards and regulations. There are, in addition, schools of education preparing teachers to work in schools, federal agencies and private foundations providing research funds to study schools, and researchers from various institutions and agencies conducting educational research to better understand and improve school functioning.

Given such complexity and the multiple stakeholders involved in the educational process, it is hardly surprising that collaborations across organizations have begun to take shape across the nation. Groups sometimes collaborate to pool resources or minimize duplication or to assist one another better serve student needs. For many reasons, including the continuing desire to enhance student achievement or reduce ever-escalating costs, collaborations will continue to grow in number and complexity. Support for this contention may be found in the focus of the recent American Association of College Teachers of Education Convention quality collaborations.

In an era of increasing financial constraint, it comes as no surprise that institutions connected in various ways to

public education are embracing a more collaborative model, one that takes advantage of complimentary institutional needs (Bellah, Madsen, Sullivan, Swidler, & Tipton, 1985). In a partnership model, emphasis is often placed on functional connectedness as when school districts and schools of education work together training future teachers (Catelli, 2002; 2006).

Other forms of collaboration include linkages between teachers unions and charter school operators. Weingarten (2007) recently described such collaboration between the United Federation of Teachers in New York City and Green Dot Public Schools, a charter school operator based in Los Angeles. In it, the two organizations collaboration will attempt to replicate a successful program developed by Green Dot in Los Angeles that included small classes and direct teacher participation in school policy and curricular decisions.

This paper describes a unique collaboration between a school of education, a board of cooperative educational services, and school districts on Long Island.

Background

At many schools of education, the graduate research course represents the culminating or final requirement in the course sequence leading to the master's degree. This degree, in turn, is required by many states, including New York, for permanent teacher certification.

One reason for placing the research course at the end of the sequence is the belief among education faculty that teachers should possess a deep understanding and appreciation of educational research before being permanently certified. That is, the teacher-practitioner should understand the research process and, at the same time, be capable of conducting his/her own research to answer questions about the classroom. The importance of the graduate research course can also be found in the current emphasis on evidence-based classroom practice and its emphasis that teachers' activities or practices reflect the latest/best practices of the field. Then too, as action researchers teachers need to be able to identify problems in their classes, determine their likely source, and efficiently change some class dimension such as seating arrangement or lesson format to eliminate or at least mitigate the problem to enhance student academic performance.

In most, if not all, of these educational research methods courses—some of which are single semester courses and many which span a whole academic year students are required to complete a final project in which they develop a hypothesis, design a study, identify appropriate respondents and obtain required permission, collect, analyze, and ultimately interpret their findings. The final product in many cases is a paper similar to those professional educational researchers conduct all the time. For most students, however, this will be their only formal immersion in the research process.

One of the most difficult tasks for faculty assigned to teach these courses is to provide students with a meaningful research experience that includes a project that truly captures their interest and enables them to conduct research into meaningful educational research questions. Because of the difficulties involved with obtaining access to students, many masters research projects end up being little more than short surveys of classmates about attitudes toward various educational practices including high-stakes testing, inclusion, or bilingual education. Alternatively, those students who are already in the classroom sometimes substitute their fellow teachers for their research participants, giving the appearance of a more meaningful research project. Then, too, sometimes students conduct small projects on their own classes the findings of which have little or no generality to other classes or their own future teaching assignments.

For the most part, students do not find such projects particularly engaging because they possess so little connection to current educational practices, and end up for most being a final, tedious hurdle to overcome. Unfortunately, rather than teaching these young teachers and teachers-in-training the value of educational research, this research experience does just the opposite. Rather than teaching them the relevance of educational research, the experience highlights its irrelevance and alienation from the real immediate world of schools, teachers, teaching, and student performance. Moreover, because of time constraints and sample limitations, many of the projects knowingly violate basic principles of research design further undermining students' respect for the research process.

These difficulties are often compounded by difficulties associated with gaining access to students or student data. Such difficulties have grown exponentially in the era of No Child Left Behind (NCLB). In a tense school environment where teachers and administrators are overburdened, district personnel have become increasingly unwilling to allow access or even listen to requests from students or the faculty supervising them.

An additional complication has grown in recent decades with the increasing concern about research ethics and the confidentiality of students' responses and their records. Rather than run the risk of violating students' rights or the extensive federal guidelines that guarantee safe and appropriate human research, many district administrators and school boards have severely limited or eliminated most graduate student research. Ironically, at the same time professors and education graduate students are facing increasing difficulties identifying and carrying out real, meaningful educational research to address important questions regarding school systems and classroom practices, school districts are under increasing pressure to collect, manage, and utilize burgeoning datasets. In response to NCLB requirements, districts have been required to collect math and English language arts achievement scores on students in grades three through eight—science scores also will be required this year.

Given the related needs of professors teaching educational research courses and administrators attempting to handle massive amounts of data while answering key questions about districts and individual schools, it would seem an ideal time for these two groups to join forces. It is from these two converging research needs—those of graduate students and their supervising faculty for research opportunities and those of school administrators for analysis and understanding of their own data—that the reader should consider the collaboration described below.

The Collaboration

The Regional Council for Research and Practice (RCRP) represents a collaborative effort between faculty members from a school of education (SOE), staff at a board of cooperative educational services (BOCES), and administrators from several school districts on Long Island. The collaboration began three years ago following a series of meetings between SOE faculty, BOCES staff including the Chief Operating Officer, and the Director of the Regional Information Center, and school district administrators seeking data-analytic assistance related to their annual test scores and other pertinent district data management concerns. From the outset, the collaboration has been viewed by each of the three constituents as a "win-win" partnership with enormous potential value for each.

It is important to emphasize that the original impetus for this collaboration came from BOCES staff that had worked both with school districts and college faculty and recognized the overlapping needs and saw a strategic opportunity for productive collaboration. At the same time, since the Regional Information Center or RIC for this geographic area of Long Island was located at this particular BOCES, it housed a great deal of the achievement data collected on students attending schools in the surrounding districts. Making this data available to these districts and assisting them in mining it was part of the regional responsibility of the BOCES administrators.

Not surprisingly, initial meetings between college professors and district personnel proceeded with considerable caution, especially on the latter group's part because of their understandable concern that they would end up providing research opportunities, but receiving little in return. As meetings continued, however, with frank discussions, it became clear to all involved that the collaboration represented a truly unique opportunity. On the one hand, as school district personnel came to understand the expertise and level of assistance that faculty and their students could provide to them with no financial expenditure, they began to buy into the collaboration. On the other, as faculty came to recognize how assisting school districts to address a host of pressing concerns could provide real and important research opportunities both for master and doctoral candidates, they, too, began to buy in.

For BOCES staff, the buy in was more immediate as they recognized how they could assist both groups through the collaboration and also realized that the collaboration could result in additional opportunities to provide services and assistance for school districts they were mandated with serving.

From the perspective of the School of Education faculty, the collaboration serves a variety of important needs. First, faculty who are teaching the culminating research experience for the School of Education masters candidates, are provided access to local school districts and their data to conduct real-world research studies to answer important questions posed by individual school districts. Finally, because the collaboration also includes Eastern Suffolk BOCES which includes the data warehouse for all student state test scores in Suffolk County and the online data analysis system—Datamentor—both masters and doctoral candidates have an opportunity to familiarize themselves with cutting-edge educational data-management systems. Such experience can be an invaluable asset as these students seek employment with school districts in the region.

Doctoral faculty in the Department of Educational Administration have also been provided access for their doctoral candidates to address more general, central office questions over more extended periods of time. This paper, however, focuses exclusively on research collaborations between master's level students and school districts, some of which have included BOCES data and some of which have not.

From the perspective of school district personnel, the collaboration provides an ongoing stream of unsalaried professionals—including both school of education faculty members and graduate students—who possess both experience and expertise in data management, design, and data analyses. Each year districts provide faculty with a series of questions they would like to have answered. Faculty then present these questions to their students who in consultation decide which are feasible and most interesting depending on teaching level—elementary, middle, and high school, and area of concentration—English Language Arts vs. Math vs. Social Studies. To date a number of projects have been completed and presented to districts and made available to a wider audience of school district personnel as well. Some of these are presented as examples below.

From the perspective of Eastern Suffolk BOCES personnel, prime movers in the formation of the Regional Council on Research and Practice, the collaboration provides a number of benefits. In New York State, BOCES operate largely as fee-for-service organizations that contract with individual districts to provide a broad array of educational services. As such, the success of individual BOCES units are determined, to some extent, by the number of districts they service and the array of services they are able to provide. Accordingly, the RCRP collaboration has provided Eastern Suffolk BOCES with a unique opportunity to showcase new and/or updated services to districts including the data management and analyses services prominently displayed to districts throughout this collaboration.

As one opportunity for such showcasing, Eastern Suffolk BOCES sponsored a forum for RCRP projects to which central school district administrators were invited from throughout Suffolk County. The RCRP forum included a broad range of projects completed by students and demonstrated the power of the new data management and curricular services to key central administration personnel from many districts. A number of other forums have been developed during the past two years including presentations to the President's Council of administrators at Dowling College.

Sample Research Projects

Three project areas are summarized in this section. A common project has been for students to examine either ELA or math trend data for school districts. Generally, these projects have been driven by district requests. Such examinations have determined whether scores within a particular grade or grades have been going up or down compared to the regional scores. They also have highlighted specific areas where a district might appear to have recurring problems such as complex math problems with multiple parts or main idea from a reading passage. Each student project concludes with a recommendation section in which the district is provided with specific actions that could be taken to improve performance domains either where they have consistently fallen below the region or where a particular grade level appears to under perform.

A second example of master's student work focused on student violence. In response to a district's request, students compared the number of recorded episodes of violence reported across two high schools in a district. District personnel had the impression that violence was occurring far more frequently at one school than another. Students were able to corroborate this impression, to determine what specific types of violent episodes occurred with greater frequency in the two high schools, and the grade levels at which violent episodes appeared to increase in frequency. Recommendations were offered to the district both regarding violence prevention programs, but also with regard to the need for more detailed record keeping to answer important outstanding questions.

A third project area addressed a district concern regarding the academic impact of transitioning from half- to full-day kindergarten. The change had occurred the previous year and administrative staff were concerned that first and second grade teachers had not modified their lessons and approach to maximize the academic enhancements that should have followed with the change to full-day kindergarten. Two students collaborated on this project that required them to carefully analyze first and second graders' reading scores. As suspected the students found that while children that had attended full-day kindergarten outperformed their half-day counterparts on initial reading tests in the fall, by the spring their performance was at the half-day level. This suggested that first grade teachers were not taking advantage of the academic advances associated with the full-day kindergarten experience so that over the course of the year their initial reading advantage had been lost.

It is important to point out that while the project was quite valuable to the district, the students learned a great deal about the research process as well. At about the midpoint of the semester, the two students met with the instructor and remarked that they were upset because they couldn't see anything in the data. It was a complex table of numbers and the instructor remarked that it was not uncommon in research to miss something when you first looked at complex data. He advised them to stop looking, take a break, and then return to the data after a few days. Having followed this advice, when they returned to the data, the pattern described above emerged to the students' delight.

Conclusions

A number of educational benefits have accrued from this collaboration. For one, because they were conducting real research addressing real school problems, graduate education students working on their masters became far more interested in their projects and research in general. One consequence of this may be that these students will become more committed to the research process and more likely to employ evidence-based practice and data-driven decision making in their own teaching. In fact, in preparing students for these projects, they are given a series of readings on both data-driven decision making and evidencebased practice and their importance for teaching today.

In addition, school and district policies were impacted by these projects because the outcomes of some of the students' research were generated by the concerns of school personnel and, consequently, had direct relevance to school policy and practice. In this way, these projects assisted districts in their own move toward data-driven decision making. Because they did not have the resources to mine the data, graduate students were able to assist them with their analyses and provide them with meaningful information that they could employ in making their policy decisions. Finally, relationships between school of education faculty and other educational agencies were strengthened which has led to further collaboration and additional research questions and projects.

Some obstacles to collaboration should also be mentioned. For instance, while students working on degrees want to select their project topics early in the academic year, school district research questions crop up throughout the year and often are not apparent early in the fall semester. Moreover, sometimes there have been logistical problems contacting school personnel or arranging meetings. School administrators wanted student help, but often did not have time available to provide information or access the students required to successfully complete their projects.

In addition, some school districts that wanted to participate in this collaboration had not provided funds to obtain access to the BOCES data management system, a fee-for-service arrangement between individual districts and BOCES. To date, BOCES administrators have been extraordinarily cooperative and even allowed students to analyze district data in areas where no formal arrangement has been established. However, this type of arrangement does not seem ideal in the long run.

Finally, while New York State is developing regional information centers throughout the state to house school district data and assist data in data analysis, other states have yet to move in this direction. Without the central data warehouse, many of the student projects that have been completed would have been impossible.

In conclusion, this three-way collaboration has been valuable for each of the educational organizations involved. While some faculty were initially discouraged because they did not feel they had enough control over school district data, those that have continued to participate understood from the outset that districts were understandably protective of their data for many reasons including the negative publicity that could be generated by negative research findings. While the collaboration continues to evolve as new districts, faculty, and BOCES staff become involved, to date, it has proved a most rewarding win-win-win effort.

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Effects of Traditional Instruction vs. Previously-Tested Tactual Resources vs. Innovative Previously Unresearched Tactual Resources on the Achievement and Attitudes of Second-Grade Students in Science

by Sherese A. Mitchell, Ed.D. and Rita Dunn, Ed.D.

ABSTRACT

The National Science Education Standards require that students should be actively engaged while learning. To increase student engagement during science lessons, we compared the effects of both previously-researched versus new unresearched tactual instructional resources versus traditional teaching-lecture, discussion, and chalk-board usage. The sample included 67, second-grade students drawn from three heterogeneously grouped classes in a low socio-economic neighborhood. We compared students' science achievement- and attittude- test scores on threee different, but comparable units taught with three alternative strategies. A counterbalanced research design indicated that the use of tactual materials, regardless of whether they were previously tested or innovative, produced higher achievement-test gains and more positive attitudes than traditional instruction.

Introduction

Although educators in every discipline acknowledge that students learn in very different ways, they teach mostly through lecture, discussion of assigned readings and, only occasionally, with hands-on instruction. However, several researchers reported that most elementary students are *tactual* and remember new and difficult information best when actively engaged with resources they manipulate (Dunn, 2001; Lister, 2005; Mitchell, 2006; O'Connell, 1999; Roberts, Dunn, Holtschnieder, Klavas, Miles, & Quinn, P, 2000; Searson, Dunn, Denig, Pierson, & Solomon, 1999; Sullivan, Dunn, Denig, Lynch, & Cantelmo, 2001).

Tactual learners concentrate when learning with instructional approaches such as Electroboards. Flip Chutes, and Task Cards (Dunn & Dunn, 1992). For example, Searson, Dunn, Denig, Pierson, and Solomon (2001) used teacher-made tactual resources to teach science to third graders. Most of those youngsters achieved significantly higher test scores with those manipulatives than they did with traditional teaching. Those who did not, verbalized that they did not like learning with their hands. They preferred learning by listening to the teacher. Almost all the children who preferred learning by listening were gifted or high achievers whose learning style had been identified as *auditory* and *teacher motivated*.

That same year, Sullivan, Dunn, Denig, Lynch, and Cantelmo (2001) experimented with a counterbalanced design in which fifth-graders learned equally difficult science vocabulary both traditionally and with these same Electroboards, Flip Chutes, or Task Cards. All participants earned statistically higher science achievement- and attitude-test scores with the hands-on resources than they did with lectures and readings. However, even in that sample, several auditory and teacher-motivated students achieved better with traditional teaching. We perceived a pattern emerging in which most students performed extremely well when actively engaged in learning with tactual resources, but in which auditory, teacher-motivated learners learned best from classroom lectures combined with readings and discussisons.

Essentially similar results were reported by Lister (2005) who taught Bermudian middle-school Special Education students and by Roberts, Dunn, Holtschnieder, Klavas, Miles, & Quinn (2000) who taught fourth graders. These researchers focused on teaching social studies with the same Electroboards, Flip Chutes, and Task Cards, but each examined group, rather than individual effects. Too, although O'Connell, Dunn, & Denig (2003) reported significantly better results with teacher-made tactual resources than with traditional teaching, they also found significantly better results when the resources were student, rather than teacher made.

In addition, many of the previously researched tactual resources were complex for young second graders to create. Thus, Mitchell (2005) experimented with tactual materials that were relatively easy for young children to construct and also examined their effectiveness on individual students.

Statement of the Problem

This research compared the effects of teaching traditionally through lecture, discussion, and readings in contrast with teaching with previously researched tactual resources versus with new, less complicated but unresearched tactual resources. Although previous studies documented that tactual materials were effective with many, we examined the outcomes of learning with innovative- versus previouslyresearched tactual resources versus learning conventionally on tactual students. The new tactual materials that we examined were the Fact Fan, Fact Wheel, and Wrap Around.

Participants

The participants in this study were 67 secondgrade students in a New York middle-class neighborhood. This group of 37 boys and 30 girls was 97 percent African American, 2 percent Hispanic American, and 1 percent Other. The sample targeted for this study consisted of three groups of children each containing 21, 23, and 23 students respectively.

Students were unaware of their diagnosed learning-style preference(s) during the instruction and assessment phases of the study. They were advised of these variables only at the completion of this research. Therefore, students' knowledge of their learning-style preferences could not have had any impact on their achievement or attitudes.

Materials

Instruments used in this study included:

- Our Wonderful Learning Styles (OWLS) (Guastello & Dunn, 1997), a global assessment designed to identify the learning styles of elementary-school children;
- the Comparative Value Scale (CVS) (O'Connell, 1999), an attitude scale designed to measure reactions to three or more variables; both previously researched and unresearched tactual instructional resources; and
- pretests, posttests, and a final examination provided by *Harcourt Science Textbook* (Bryant, 2005).

Procedures

OWLS was was used to identify the children's learning styles at the end of the administration of the posttest. This assessment revealed students' perceptual preferences and how each child was most likely to master new and difficult information. Students' attitudes toward-science instruction were assessed with the CVS (O'Connell, 1999) that compared the three instructional strategies employed in this research.

A counterbalanced research design was employed (see Table 1). During the first session of instruction, Group 1

Table 1

Science Instruction by Treatment and Sequence

	Sequence of	of Counterba	lanced Treatments
	<u>Group 1</u>	<u>Group 2</u>	<u>Group 3</u>
	Lesson 1 Lesson 3 Lesson 2	Lesson 3 Lesson 2 Lesson 1	Lesson 2 Lesson 1 Lesson 3
Note Less Less Less	: on 1=Previo on 2=Traditi on 3=Previo	ously Tested ional Instruc ously Tested	Tactual Resources tion Tactual Resources

was taught with previously-tested tactual resources, Group 2 was taught with innovative tactual resources, and Group 3 was taught traditionally. During the second session of instruction, Group 1 was taught with innovative tactual resources, Group 2 was taught traditionally, and Group 3 was taught with the previously tested tactual resources. During the final session of instruction, Group 1 was taught traditionally, Group 2 with previously tested tactual resources, and Group 3 with the innovative tactual resources, and Group 3 with the innovative tactual resources. We used this counterbalanced design to determine whether achievement and attitude differences would be revealed among students when learning with traditional versus when learning with previously-tested versus with innovative-tactual resources.

When using the three instructional methods, students were provided the same amount of time in which to master equally difficult but different lessons. During the lesson taught with previously tested resources, students were given the objectives to be mastered by manipulating Flip Chutes and Electroboards and assembling Task Cards. During the lesson taught with innovative resources, students were given the objectives to be mastered and were encouraged to master them by using the Fact Wraps, Fact Fans, and Fact Circles. During the traditional lesson, students were given the objectives to be mastered and were taught by the teacher based on a lesson plan in the *Harcourt textbook* (2005) that required lecture, discussion, and follow-up reading.

Statistical Analyses

Data were examined employing a single-factor, within-subjects analysis of variance (ANOVA) of gain scores to determine effects of science achievement with each treatment. A series of t-tests were employed to determine interactions among attitudes, achievement, and tactual preferences (if any).

Results

The analyzed data were used to test each of the following hypotheses:

- HO1: There will be no significant differences among the science achievement-test scores of second-grade students taught using innovative tactual resources versus traditional instruction.
- H02: There will be no significant differences among the science achievement-test scores of second-grade students taught using previously tested materials versus innovative tactual resources.
- HI: There will be significant differences among the science achievement-test scores of second-grade students taught using previously tested materials versus traditional instruction.

The results of a single-factor, within-subjects ANOVA rejected the Null Hypothesis 1 and supported Hypothesis 1 and Null Hypothesis 2. The mean achievement test-scores of students exposed to all three treatments revealed that students performed significantly better when they used either of the two tactual methods (innovative tactuals = 48.43 and previously researched tactuals = 45.26) as compared with the traditional method (35.87) (**See Table 3**).

However, when the mean gain scores of the innovative and previously used tactuals were compared, there was no significant difference between the two tactual treatments. Indeed, there was only a 3 point gain in favor of the innovative tactual resources (see Table 2).

Table 2Descriptive Statistics for Mean Achievement Test-scores			
TI Gain on Traditional Instruction Task	M 35.87	SD 21.42	
ITR Gain on Innovative Tactual Resources	48.43	27.13	
PTTR Gain on Previously-Tested Resources	45.26	25.75	
Note: <i>N=67</i>			

Table 3

Pairwise Comparisons for Instructional Conditions: Mean Differences, Standard Errors, and Confidence Intervals

(I)	(J)	Mean Difference	(I-Standard	p	95% Confidence li	nterval
		5)	EIIOI		Lower Bounds	Upper
1	2	-12.567(*)	4.380	.006	-21.312	-3.822
TI *	3	-9.396(*)	3.929	.020	-17.240	-1.551
2	1	12.567(*)	4.380	.006	3.822	21.312
ITR*	3	3.172	4.185	.451	-5.183	11.526
3	1	9.396(*)	3.929	.020	1.551	17.240
PTTR+	2	-3.172	4.185	.451	-11.526	5.183

Note: * TI=Traditional Instruction

** ITR= Innovative Tactual Resources

+ PTTR= Previously Tested Tactual Resources

The third null hypothesis was:

H03: There will be no significant differences in the attitudestoward-science of second grade students taught using traditional instruction versus those same students taught with innovative resources and with previously tested tactual materials. A series of single factor t-tests performed on the items of the CVS attitude scale showed that this Null Hypothesis was not supported. All the ratings that were significantly higher than 3.0 indicated that the traditional instruction was less preferred than the other two instructional methods. Therefore, Null Hypothesis 3 was rejected due to the existence of significant differences in attitudes-toward-science of second-grade students. (See Table 4).

Table 4

Comparative Value Scale Questions	t ratio
	(df=66)
C 1 TT vs. PTTR in Helping you LEARN	5.534
C2 TT vs. IR in Helping you LEARN	4.850
C3 TT vs. PTTR in helping you REMEMBER	4.449
C4 TT vs. IR in helping you REMEMBER	5.763
C5 TT vs. PTTR in helping you UNDERSTAND	5.958
C6 TT vs. IR in helping you UNDERSTAND	4.182
C7 TT vs. PTTR in helping you ENJOY LEARNING	5.635
C8 TT vs. IR in helping you ENJOY LEARNING	6.527

Single-sample t-Tests for Comparative Value Scale: Significant t Ratios

Note: p<0.0001 for all cases

H2: There will be a significant interaction between students' tactual preferences and their achievement.

A comparison of test means indicated that students who were diagnosed with a strong tactual preference performed significantly better than students who had no preference for tactual resources. Four students exhibited a strong tactual preference and performed better when their tactual preference was accommodated compared with the performance of children who had a lower or no tactual preference at all. Moreover, students with a strong tactual preference received higher mean scores in each tactual condition (ITR= 85.5 and PTTR= 83.3) versus the TI (69.0). These data corroborated that students who strongly preferred hands-on materials while learning performed statistically better with tactual materials (Dunn & Dunn, 2005).

Although, there was no interaction between the (only) four strongly tactual students' learning styles and the method of teaching them, there was a large effect size (PTTR-d=.801 and ITTR-d=.999) that resulted from both tactual treatments (**See Table 5**). It is unusual to obtain significance with just four students.

Hypothesis 3 was:

H3: There will be a significant interaction between students' tactual preferences and their attitudinal-test scores.

Table 5

Cohen's d Effect Size for Strongly Tactual Students

Effect Size (d)
0.801
0.999
0.121

Note: *small effect size -. 0 - .2 medium effect size -.3 - .5 large effect size -.6 - 2.0

The data from t-tests performed on each level of tactual preference for these second-grade students revealed that, as the strength of the tactual preference increased, so did students' attitude-test scores. Students with strong tactual preferences performed statistically better (M=36.75) than the moderately, low, or non-tactual students (M=30.00). The moderately tactual students scored better (M=32.54) than the lower or non-tactual students (M=28.94).

Figure 1 demonstrates the correlation between students' attitudes and their tactual preferences. The means moves in a step-wise fashion from the low tactual students to those with a higher preference. In each case, the lower to non-tactual groups scored lower on the attitudinal test as opposed to the higher or strongly tactual groups. However, the differences among scores were not significant. Apparently, as the strength of students' tactual preferences decreased, so did the significance level.

Discussion

Although each student is different and more or less receptive to varied instructional treatments, these findings have shown the following.

- 1. Both previously tested teacher-made, and innovative student-made tactual resources increased the achievement and attitudes-toward-learning science among these young learners.
- Data resulting from previous experimental studies concerning the effects of tactual materials on elementary and middle-school students were supported (Lister, 2005; Roberts, Dunn, Holtschnieder, Klavas, Miles, & Quinn, 2000-2001); Searson, Dunn, Denig, Piersons, & Solomon, 2001; Schiering & Dunn, 2001; Sullivan, Dunn, Denig, Lynch, & Cantelmo (2001). However, these researchers addressed group rather than individual achievement with tactual materials.
- 3. These results clearly demonstrated a strong effect size resulting from tactual students learning with hands-on resources. They demonstrate why tactual resources are necessary for tactual learners, although less important for others.



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Paul J. Pedota, Ed.D.

Abstract

Alternative teaching certification programs have been developed to help solve the problem of finding teachers to serve in subject content shortage areas as well as hard-to-staff schools. The New York City Teaching Fellows Program is such a program. This article describes the program that St. John's University (Queens) has developed to meet the needs of those individuals entering the teaching profession through an alternative route and their impact on the students in "high-needs" New York City schools.

Too many gualified teachers leave teaching early in their career. Between the first and third year of teaching, thirteen to twenty percent of new teachers leave the profession (Henke and Zahn, 2001; Darling-Hammond and Scian, 1996). According to the National Commission on Teaching and America's Future (2002), the turnover of new teachers in high needs schools is even greater, with a third leaving after one year and almost half after five years. As a result there is a constant need to attract individuals into the teaching profession. The New York City Teaching Fellows has been established as a collaborative effort among the New York City Department of Education and selected universities, one of which is St. John's University, to attract individuals' to serve as classroom teachers.

The program's goal is to select and train individuals who want to change their career and obtain Alternative Teacher Certification for the purpose of teaching in hard to staff schools and curricula. In their 2002 study, Feistritzer and Chester refer to alternative teacher certification programs as "... programs that address the professional preparation needs of the growing population of individuals who already have at least a bachelor's degree and considerable life experience and want to become teachers" (p.3).

In New York City, as well as other parts of the country where one finds high needs schools prevalent, it is very difficult to attract the number of individuals needed to fill the void left by those who leave the teaching profession. According to the Ready to Teach Act (2003), high need schools are defined as those that have at least 20% of their students' families living below the poverty line; this number has not changed in 15 years (Hodgkinson, 2000/2001). In addition, according to the U.S. Department of Education (2000/2001) and U.S. Department of Commerce, Bureau of Census (December 2002), almost twenty-nine percent of students living in large U.S. cities are in families that fall below the poverty line (as cited in Diaz, Pelletier, and Provenzo, 2006).

Most educators also agree that a high need school has students that are not only academically and economically disadvantaged but are also in need of special services such as programs for English Language Learners (ELL) and Students with Disabilities. There has been a growing need to find highly qualified teachers who are willing to work with students who are challenged by their special needs as well as economically and academically disadvantaged.

In an attempt to help high need districts and schools the Federal government has developed the Transition to Teaching Program. This program aims to increase the pool of qualified teachers in high need schools by recruiting recent graduates and highly gualified mid-career professionals outside of education for alternative routes to teacher certification. Alternative certification programs usually provide support through the use of mentors who can provide both emotional and professional help to the teacher candidate.

These candidates in the alternative certification path enter the field of education without using the traditional route of taking courses and doing student teaching in an approved college educational program.

Although there are many different reasons why individuals enter the teaching profession as second career professionals, most boards of education use alternative preparation routes to attract individuals with college degrees and work experiences other than teaching for hard-to-staff geographical areas and subjects.

The New York City Teaching Fellows Program finds potential teachers who can serve in subject shortage areas such as, English, math, science, special education, bi-lingual education, for hard-to-staff schools. All of the individuals possess a minimum of a Bachelor's Degree and some have earned advanced degrees (Master's and Ph.D.).

Although previous educational background may be an important ingredient in looking at potential candidates, other individual factors such as maturity and the ability to relate to students from diverse cultures in economically deprived areas are also important factors. The New York City Department of Education screens individuals through a written application and an interview and then allows selected individuals to choose a university for training. The choice of the university usually depends on geographical proximity to where the candidate will eventually teach.

The New York City Department of Education has been able to successfully recruit a diverse pool of teacher candidates in terms of age, sex, ethnicity, and personal experience outside the field of education. Comparing the graduates of traditional teacher preparation programs to those in the New York City Teaching Fellows Program, the students in this alternative program are older, usually have financial responsibilities and obligations that exceed those in a traditional program, and have more real world experiences. As a result family support as well as financial support is important if a teacher is to be successful (Clewell and Villegas, 2001).

Once students are accepted into the Teaching Fellows Program, they are allowed to select from the various universities and colleges throughout the city that have been awarded grants for the New York City Department of Education. At the same time, teaching candidates are placed in schools for the summer to experience firsthand the realities of teaching in an urban setting. Field experience is an important component of effective teacher preparation programs (Koeppen, Huey, Gayle, Connor, 2000). In the field placements, students experience the realities of instructional design and execution with children in an authentic setting.

An Overview of Program Structure at St. John's University

Faculty in the New York City Teaching Fellows Program at St. John's University assists those individuals chosen by the city to participate in the university program in two critical subject shortage areas, math and English.

The students assigned to the St. John's University program are grouped into cohorts to support each other. In their research, Shoko and Martin (1999) concluded that being in a cohort could be a key factor in a new teacher's perceptions of the quality of the preparation they received and their own sense of competence and connectedness.

These cohorts consist of beginning teachers who need assistance in curriculum development, selection of materials and resources in their subject area, effective teaching strategies and how to deal with students (Stone and Mata, 2000). Additionally, the academic program includes rigorous educational courses facilitated by highly qualified professionals who have served in the field of teaching.

The Teaching Fellows who attend St. John's University hope to become secondary school teachers. They begin their academic study the summer before they are scheduled to teach. To teach at the secondary school level is a challenge, therefore, their first course at St. John's offers extensive pedagogical training in instruction that includes how students learn and behave. Students are exposed to

the three areas and levels of student learning - the Cognitive domain which has as its purpose to develop students' intellectual ability and skills (Bloom, 1956), the Affective domain which focuses on the attitudes, feelings, interests and values of students (Krathwohl, Bloom, and Masia, 1964), and the Psychomotor domain which contains objectives that support the development of motor and muscular skills (Harrow, 1972 and Jewett and Mullan, 1977). In addition, theories that address multiple intelligences as a way for students to understand content are addressed (Gardner, 1983, 1999, Krechevsky and Seidel, 1998). Also, learning styles "...the way in which each learner begins to concentrate on, process, and retain new and different information" (Dunn and Dunn, 1993, p.2) are utilized in daily activities. Techniques that can be used with students who are from diverse backgrounds as well as those with special needs are discussed and carefully elaborated in model lessons (Rothstein-Fisch, Greenfield, and Turmbull, 1999). In addition professors discuss and model effective classroom management techniques (Pedota, 2007). According to the New York City Department of Education Fellows' evaluations, the program has been successful because professors model a climate of mutual respect between the students and themselves that carry over once the individual is working with his/her own students. Fellows also practice understanding students, their interests and problems which provide the basis for a caring environment allowing their students to develop a positive attitude toward themselves and their ability to succeed, (Noddings, 2001).

In addition, there is a strong mentoring component that helps to support a positive transition to the classroom through the extensive and efficient support that is given by University mentors (Nakai and Turley, 2003). This is a key component if teachers are to stay in the profession (Lauer, 2001). There is also a coordinator who interacts and intercedes with Fellows, their mentors, and school placement personnel to ensure that the Teaching Fellows receive the support that is needed to help them overcome any problems they may encounter. In addition, those students who have the additional support of a "buddy teacher" seem to have fewer organizational problems within their assigned school.

Why the Program Succeeds

According to various studies, teachers who have a positive approach to teaching and teacher-generated class-room atmosphere as well as challenge their students to think critically in a friendly encouraging environment are successful in motivating students to have high expectations of what they can accomplish (Ennis, 1987; Paul, 1995; Beyer, 1997; Wiggins, 1998).

As can be seen in Figure 1 (High Quality Alternative Teaching Model), St. John's University Program has used this approach in their curriculum to develop high quality teachers; that is, teachers who exhibit more positive characteristics such as warmth, perceptiveness, empathy, flexibility, ingenuity, task effectiveness, smoothness and consistency (Harvey, Prather, Alter, and Hofmiester 1966 and cited in Glickman, Gordon, Ross-Gordon, 2007).





This model, formulated by the University professors, is utilized as Teaching Fellows are first deployed into New York City Public Schools where they observe instruction and have an opportunity to practice what they are learning and return back to the classroom to collaborate with their peers and professors. When school begins in the fall, Fellows participate in a methods course in the curriculum within their own subject area. The Fellows are also mentored by New York City Department of Education personnel as well as veteran teachers and former New York City Department of Education Supervisors who are employed by St. John's University. These consultants follow a hands-on personalized approach to mentoring which is not used as an evaluation tool by either the New York City Department of Education or the University.

In all of the <u>New York City Teaching Fellows End of</u> <u>Year Survey Results</u> data dating back to 2003, New York City Teaching Fellows have always rated their experience at St. John's in the area of coursework and the quality of their university professors as important factors in increasing their effectiveness. As a result of this positive experience, in the Academic Year Results for In-Service Training 2006-2007, 96% of St. John's Teaching Fellows reported that they intend to remain in teaching in New York City for at least 2 more years.

The university mentors meet with the university coordinator each semester to explore different methods that will give positive support to teachers to enhance their effectiveness. All of the program's faculty members are not only able to coach but also motivate and model best practices. Having an atmosphere of professional collaboration to discuss practices and problems as well as how to plan together to solve problems is critical to the nurturing and growth of new teachers. University mentors have also been cited by Teaching Fellows as providing the above services as well as their assistance and their support.

As in the research conducted by Harper, McDougall, and Squires, (2000), the program utilized by university faculty places emphasis on the use of motivational tools that will help students to want to learn, as well as techniques that support learning for all students such as integrating computers into class lessons using constructivist principles, working in teams, and techniques to get students to de-escalate violence. Suggestions on how to work effectively with parents as partners are also discussed (Comer, 1993). Additional time is spent on the proper use of differentiated instruction, a philosophy that enables teachers to plan strategically in order to reach the needs of all learners (Gregory and Chapman, 2002). This is accomplished by explaining and modeling for students the use of graphic organizers, reading materials that have different levels of complexity, the use of flexible learning groups for instruction, curriculum compacting, and learning centered activities (Tomlinson, 2004).

Based on conversations with first year Teaching Fellows they report that the first year of teaching is rewarding, frustrating, and stressful and recommend the following:

- It is important for new teachers not to be given the most challenging classes
- The orientation of new teachers is a critical component
- Teachers must know what to teach
- Teachers must know the policies and procedures in their schools that should be followed
- Principals must provide the necessary support and encouragement to provide a smooth transition into the classroom
- Professional development must be provided
- Providing positive and corrective feedback is important

Conclusion

Teaching and learning are very complex processes that are affected by extrinsic as well as intrinsic factors. It is not only important to know subject matter but it is equally important to know your students as well as yourself.

The fact that St. John's has been able to develop a program which is very successful is a credit to all those who are involved and there are many variables that have helped.

First of all, the individuals who are employed by the University as mentors have certain traits that set them apart from others. By modeling the behaviors listed below they have successfully been able to transfer their behavior to their students:

- Are eager to learn
- Make it a habit of thinking things through
- Give honest answers
- Model respect for their students
- Work to master their craft
- Develop responsibility for themselves and their students

- Appreciate the fact that each individual has unique talents
- Values and encourages education
- Are able to laugh as well as be serious

In addition, by modeling their instructors who teach at St. John's, the Fellows embrace their multicultural classrooms and make a conscious effort to incorporate caring and inclusive practices so that all students have the same opportunities to learn and be successful. According to Gloria Ladson-Billings in this type of classroom one would see behavior that would indicate among others the belief that even though there is complexity in diversity and individual differences, all students should be held in high-esteem and that if students are encouraged to work collaboratively together and take responsibility for one another that all students can learn and succeed (1994).

In the end of year assessments that have been conducted by the Department of Education, The New York City Teaching Fellows who attend St. John's University have continually rated the program with scores that exceed those of other universities. In addition, the students believe that the Master's program has contributed to their effectiveness as teachers.

The strength of the program at St. John's is embedded in the dedication of the professors who not only know their subject matter and are able to deliver it but are nurturing and caring individuals who model the best practices they want their students to have in order to become true professionals who are a credit to themselves, their professors, but more importantly their students.

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Planning for High-Functioning College-Bound High School Students with Asperger's Syndrome

- by Barton S. Allen, Jr., Ed.D.

In planning a program for a college-bound high school student with Asperger's Syndrome, one must take into account the resources of Special Education services on Long Island. Autism diagnoses are exploding across Long Island and the nation. The number of school age children classified in Nassau and Suffolk counties has jumped by 50% to more than 3,000 students (Newsday 2007). These numbers have not allowed districts to adequately provide services for these students with Aspergers's Syndrome, especially those who are college bound. Historically, Asperger's Syndrome is a relatively new category of a developmental disorder, the term only coming into general use in the past 15 years.

High school is associated with great changes in school environment. The size of the school usually increases and departmentalized teaching increases expectations for grades and achievement. Students are also subject to more rigorous grading policies and more copious homework assignments. (Mullins & Irwin, 2000) Also at this time there is an increase in social expectations and onset of puberty.

Several characteristics of Asperger's Syndrome seem to have the greatest impact during the adolescent and young adult years when successful social relationships are the key to most achievements (Tantarn, D. (1991). Studies have shown that adolescents and adults with Asperger's Syndrome frequently experience depression (Ghaziuddin, Weidmer-Mikhail & Ghaziuddin, 1998) and are more likely to be at risk of suicide (Wolff, 1995). By the time the Aspereger's Syndrome students reach high school, they are discouraged by past academic and social difficulties that result in poor self-esteem. Their lack of social skills with their fellow students becomes more apparent when no one talks to them or sits with them at lunch or on the school bus. Therefore the transition to high school can become a very difficult process and makes the high school environment a very uncomfortable one for these students. They can become the object of jokes and feel a profound sense of being lost in the crowd.

Definition of Asperger's Syndrome (American Psychiatric Association 1994)

The new DSM-4 criteria for a diagnosis of Asperger's Syn-

drome, with much of their language carrying over from the diagnostic criteria for Autism, include the presence of:

Qualitative impairment in social interaction involving some or all of the following: impaired use of nonverbal behaviors to regulate social interaction, failure to develop age-appropriate peer relationships, lack of spontaneous interest in sharing experiences with others, and lack of social or emotional reciprocity.

Restricted, repetitive, and stereotyped patterns of behavior, interests and activities involving: preoccupation with one or more stereotyped and restricted pattern of interest, inflexible adherence to specific nonfunctional routines or rituals, stereotyped or repetitive motor mannerisms, or preoccupation with parts of objects.

These behaviors must be sufficient to interfere significantly with social or other areas of functioning. Furthermore, there must be no significant associated delay in general cognitive function, self-help/adaptive skills, interest in the environment, or overall language development.

According to Gillberg(1998), a Swedish physician who has studied AS extensively, has proposed six criteria for the diagnosis, elaborating upon the criteria set forth in DSM-4. His six criteria capture the unique style of these children and include:

Social impairment with extreme egocentricity, which may include:

- Inability to interact with peers
- Lack of desire to interact with peers
- Poor appreciation of social clues

• Socially and emotionally inappropriate responses Limited interests and preoccupations, including:

- More rote than meaning
- Relatively exclusive of other interests
- Repetitive adherence

Repetitive routines or rituals that may be:

- Imposed on self, or
- Imposed on others

Speech and language peculiarities, such as:

- Delayed early development possible but not consistently seen - superficially perfect expressive language
- Odd prosody, peculiar voice characteristics
- Impaired comprehension including misinterpretation of literal and implied meanings

Nonverbal communication problems, such as:

- Limited use of gesture
- Clumsy body language
- Limited or inappropriate facial expression
- Peculiar "stiff" gaze
- Difficulty adjusting physical proximity

Motor clumsiness

May not be necessary part of the picture in all cases

Having been a special education principal for over 20 years with Western Suffolk BOCES, I have interviewed a number of families moving to Long Island because of expanding Special Education services for both school age children as well as those for adults. Additionally, parents who have left the area are often forced to move back because of the lack of quality services in the areas they have moved to, and the need to utilize better services offered here. Answers to the geometric growth have been measured. A number of expanding public and private schoolage programs for children with autism do exist in the metro area. The New York State Education Department has decided to address part of the problem by placing close to 60 New York State handicapped students in other state's residential schools here on Long Island. New York State's goal is to add 163 new residential beds, one of which is to start a college prep program for teens with Asperger's Syndrome (Newsday, 2008).

We are moving in the right direction with room to further improve our services to students with AS. We need to take to heart the thoughts conveyed in a letter to the editor of Newsday (2007) by Marc Rosen, a young man who has been diagnosed with various autistic spectrum disorders. His message, "Don't try to make autistic kids normal." According to Mr. Rosen, part of his life wouldn't have happened if he was better understood and wasn't persuaded that he was diseased, disordered or sick and in need of a cure. Among those autistic people who have found acceptance, Mr. Rosen says, that they are happy the way they are and don't want to be "cured" (Mr. Rosen's italics).

All of the literature as well as recent shows on television, 60 Minutes and the Oprah Show, talks about the dramatic growth of autism (1 in 150), early diagnosis, early intervention, ABA teach etc, yet our only real understanding of AS may come from Dustin Hoffman in Rain Man. We really need to know this population better and how to help them lead a full productive life. Therefore we must address the needs of college-bound high school students with AS. We should start with the following premise: the majority of teens with AS graduate from high school and go on to college. We must also realize that AS is a disorder that lasts one's entire lifetime. The usual educational approach has been to discuss what is wrong with the student, e.g. specific disorders and weaknesses, then remediate. With AS, we should look at the student's strengths first and then come up with a total educational and social skills plan to assist these students. AS students' possible strengths can be as follows:

- Average to above average intelligence which would enable them to handle more challenging courses
- Excellent memory for facts-their attention to detail and strong memories will make various assignments easy for them
- Attention to detail .
- Content with repetitive tasks .
- Rare absences
- Creative-can think outside of the box
- Loves to work .
- Can work alone .
- . Able to maintain routines
- . High interest in certain areas which may be applicable to certain high school students

Knowing the above strengths, one should incorporate the following supports to complement an AS student's strengths:

- 1. Provide a mentor (guidance counselor, social worker or school psychologist), and a place where an AS student can have some one to one talks and that person can be an advocate for the student.
- Clear expectations from teachers and support 2. staff-both written and verbal, outlining for the AS student the what, when, where and how to accomplish the task.
- Organization-give additional time in the day for 3. class work, assignments and counseling. This would also mean that the AS student would possibly need increased time to learn certain topics or social situations. Part of organization is how to adjust to change in tasks, procedures, schedules, etc. Also, written information in writing increases success rather than verbal instructions. Organization, preparation, focus are keys to success for high school AS students.
- 4. Similar classmates with Asperger's Syndrome-They need to feel that there are others just the same as they are. They do not need to feel like they are always drowning and that there is someone else just like they are feeling the same daily changes.
- 5. Interests-Individual interests are important to AS high school students. Teachers and support staff must make sure that the students' possible repetitive interests are age appropriate and channeled properly.

Transition Process to High School

In order to ensure success, several transition meeting should take place in Middle School. Participants should include the AS student, parents, guidance counselors, support staff and teachers. This is an important step. Research has identified that sparse collaboration and communication between and among school programs and staff can be a significant impediment to the success of the transition process (Black 1999). At the meeting it is of utmost importance to establish realistic goals for the AS student during the first few weeks of school. The next step should be training for school personnel. It is extremely important that school personnel have an understanding of Asperger Syndrome and how it can affect behavior and academic performance. Staff will need to know how to implement modifications, adaptations and strategies when dealing with these students. These steps will make a difference in the transition of these AS students and their success.

Lastly, a thorough student orientation should take place in order for these new students to feel comfortable in their new school. We know that AS students will have difficulty adjusting to change, so the orientation should take place prior to the beginning of school. In addition to familiarizing the students with the school building and its personnel, unstructured time that the students spend needs to be looked at because this can also be problematic for AS students. The following situations should be looked at with the students: bus rides to and from school; changing classes; gym class; study hall; before and after school.

Socialization, environment and teamwork are areas of usual concern in schools especially for those who are AS high school students. Limit social contact at times of the day in order to give students a time to decompress, relax and prepare for the day's activities and pressures. This could be a place where these students could be away from other students. The goal of teamwork should be limited or not encouraged due to the nature and ability of AS high school students.

Final Reflections

We must remember that AS high school students can attend college and graduate. They can also function successfully in a work environment because of the traits outlined previously. If we can see beyond the usual stereotype that AS is a disability and begin to see that AS could be a "difference," this would lead to a more positive view of AS and the school system's view and ability to meet these students' educational and social needs. Because many AS students have the academic aptitude necessary to complete university level courses, what is needed to help them succeed is an educational organization such as BOCES that is actively engaged in a joint partnership with the university to provide a social support system as well as the educational component so that these students can achieve the next level of success-a college or university education.

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INTRODUCTION

In 2000, the Marie and John Zimmermann Foundation approached three colleges with an offer to support an academic mentoring program that would place college students as mentors for urban area middle-school students. Four years later, and three years after college mentors began to work twice a week at local middle schools with academically at-risk adolescents, the Zimmermann Foundation announced it would continue to fund the recently renamed Jones-Zimmermann Academic Mentoring Program (J-Z AMP) with a commitment to continue support through June 2007.

What structures, activities and external relationships are crucial to a program's success? While the particular essential elements vary from program to program, they generally include demographic or other characteristics of participants; intensity and duration of programming; the content and flexibility of activities; key transition points for participants; the presence and types of requirements and incentives for participation; performance expectations for participants and staff; staff qualifications and configuration; characteristics of the organization that operates the program; and the program's relationships with other organizations and agencies.

Identifying essential elements is typically not an easy task. Programs are forms of knowledge, and one can never be entirely certain how the knowledge reflected in any given change model causes the favorable results attributed to it. Some ambiguity always remains. Social programs have the added complexity of focusing on trying to modify the behavior or attitudes of people-either program participants or those who affect them. And since programs are, in essence, coproduced by their staffs, participants, and others, they will inevitably vary to some extent from one location to the next because the people involved vary. These are not arguments against identifying essential elements. Rather, they are reasons for being particularly careful when analyzing program experiences, to define those essential elements and to identify what flexibility programs must have so that they can be adapted to local circumstances without compromising the ability to achieve results.

The purpose of this study is to draw upon the experiences of the first three years of the model's implementation. It takes its examples from three programs that followed the model's essential elements, but whose environments were distinctly different, whose mentoring histories varied, and whose program structures had different degrees of opportunity.

Summary of The Jones-Zimmermann Academic Mentoring Program Principles

THE NEED:

- The need for supplementary instruction for students to enhance their potential for success is well documented.
- Seventh grade marginal students are the targeted group for two reasons: seventh grade starts the transition from self-contained elementary classrooms to departmental instruction and it is the age level where parental influence diminishes in favor of peer group experience.
- Data show that many low income and talented minority students in urban settings fail to reach their full academic potential.

GOALS:

- 1. To provide evidence that a structured mentoring program in urban school systems will improve educational performance and increase high school graduation rates, and that such a program be staffed by college students as part of a college educational experience.
- 2. To produce approaches to cost/benefit analysis through quantifiable measures of success, as well as subjective commentary.
- 3. To produce a cookbook of the program and key features that can be published for other cities.

OBJECTIVES:

- To encourage middle school students to graduate from high school and to aspire to higher education levels.
- To reduce school dropout rates at the high school level.
- To remediate competency in two foundational areas: English communication skills and mathematics quantitative skills.
- To build self confidence and positive social values in mentored students.

- To develop an appreciation among college students for the teaching profession.
- To provide an on-going source of trained academic mentors for local school systems.

THE PROGRAM:

- Should be focused on three primary attributes for successful learning: motivation, concentration, and mastery of skills.
- 2. Subject tutoring should focus on homework assignments and skill development needs.
- 3. The mentor should have considerable flexibility in motivating the mentees.
- 4. Should include some social activities to encourage interest in college.

PROGRAM STRUCTURE:

- 1. Each mentor should be responsible for two students, creating "triangular bonding" where the students can help each other in understanding, learning to cooperate, and being more aggressive in pursuing their goals.
- 2. The mentor must be of the same sex as her or his mentees.
- Mentoring sessions should be held in a public school building twice a week after school and include a refreshment break.
- 4. School busing after mentoring sessions should be provided.
- 5. Written parental approval should be required before enrollment of mentees.

FACULTY SUPERVISION:

- One or more public school teachers should be named a program coordinator.
- A college professor should be responsible for coordination of mentor performance as a part of a college course.

The Jones-Zimmermann Academic Mentoring Program

A "PUURR" Approach To Impact Drop-Out Rates:

A **Partnership** between local universities and inner-city schools to improve education's weakest link

A **Unique** program where a university-school contract provides a 3-year, structured mentoring program with measurable results

An **Urban** program, in progress, directed at inner city, below grade children who typically are at risk to drop out and have little chance to go to college

A **Replicable** program with design specifics and implementation guidelines that can be adopted by any major city

A **Research** program directed at providing what variables produce school success, increased aspirations for college education, and the building of community (Hughes, 2001).

THEORETICAL FRAMEWORK

In the past, dropout theory has linked student's background with dropping out (Taylor-Dunlop, 1997). Over time, the concept of dropping out has evolved into the concept of at-risk which focuses on the potential for dropping out. According to Wehlage, Tabachnick, Rutter, Fernandez, & Lesko (1989), dropping out is an event in a long series of life stresses. All students are at risk, but for some, at a certain point, the risk becomes simply too high.

In addition to being confronted with background obstacles, students experience active negative forces in the schools themselves. These forces are identified as impediments and include the lack of intrinsic rewards, teacher obsession with covering curriculum, technical definitions of knowledge, mechanical perceptions of success, and a lack of variety in teaching styles (Wehlage, et al., 1989; Popkewitz, Tabacknick & Wehlage, 1982; Taylor-Dunlop, 1997).

Research on successful secondary schools has cited common characteristics that include a quality of caring comprised of shared values, a sense of belonging, a sense of school membership, and academic engagement (Goodlad, 1984; Wehlage, 1989). Engagement requires intention, concentration, and commitment by students and staff. As with school membership, the degree of engagement is highly dependent upon the institution's contribution to the equation that produces learning. Engagement is a result of interaction between the students, teachers, and curriculum (Taylor-Dunlop, 1997; Wehlage, 1989). According to the National Institute on the Education of At-Risk Students (1999), research on school reform has led to the identification of four elements that students need from their schools: relevant schoolwork, a nurturing and supportive environment, opportunities for academic success, and help with personal problems.

It has been found that 40 to 60 percent of high school students are chronically disengaged. The students say that they are inattentive, do not complete assignments, and are bored in school (Rumberger, 2003). Student absenteeism (cutting class or skipping school for reasons other than illness) also illustrates a lack of engagement. As students go from one grade level to the next, the number of absences increases. In 2002, 11 percent of eighth graders did not attend school compared to 33 percent of twelfth graders who say they skipped school 1 day during a 4-week period (National Center for Educational Statistics, 2002).

When students become disengaged in their learning, the chances of their dropping out of school dramatically increase (Newmann, 1992). Nationwide 1.5 million teens were out not in school and did not graduate from high school in the year 2000. Students who did not drop out, but saw no value in school, found other ways of occupying their time. Out of 2,000 youth, 40 percent said that they worked an average of 3 hours after school, and spent 2 hours "hanging out with their friends" (Rumberger, 2004), p.13). Improving student interest in school, ultimately improving student performance, is going to require more than raising standards. It is going to require that students be involved in their own learning. College mentors are again in a unique position to engage students. The mentor is both friend and teacher.

METHODOLOGY

The Importance of Measurement:

The success of this academic mentoring program on a continuing basis and the potential for broader funding and greatly increased participation in other cities will depend on the ability of the program management to demonstrate by various measurement criteria that mentoring on a rigorous, regularly scheduled basis offers unparalleled advantages to youngsters who are below grade level and at risk of failure. The system of measurement should include both objective and subjective measures of academic learning, as well as social indicators of behavior. All measures should capture data for the students in the mentor program and the mentors (Jones, 1991).

The Jones-Zimmermann University Sites:

Three universities were chosen by the Foundation to receive a portion of the 1 million dollar grant in order to coordinate and implement the academic mentoring program. The selection process highlighted the fact that the universities were in an urban locale, possessed an appropriate number of graduate and/or undergraduate student mentors, and a multicultural faculty and student body, and exhibited an ability and desire to work with their local educational system. St. John's University partnered with the Jones/Zimmermann Foundation, agreeing to conduct evaluative research on the project over the three years that the project would be implemented. Each university had to choose an urban middle school site to partner with for implementation of the program. Additionally, the colleges

Figure 1 – Student Gender Demographics			
	School A	School B	School C
# of Participants	34	26	21
Male/Female	13M / 21F	9M / 17F	5M / 16F

Figure 2 – Mentor Demographics			
	School A	School B	School C
# of Mentors	16	17	12
Male/Female	5M / 11F	8M / 9F	14F
Ethnicity	13 Caucasian 2 Hispanic 1 Afr-Amer	13 Caucasian 2 Hispanic 2 Afr-Amer	13 Caucasian 1 Hispanic 1 Afr-Amer
Form of Compensation	Hourly \$10.00	Hourly \$7.40	\$3,000 Stipend

would be charged to choose mentors and mentees to participate in the program. The participants within the program were sixth grade at-risk students who had been identified as needing remediation in language arts and mathematics. Two mentees would be paired with one mentor, who would help the students in both prescribed areas of remediation as well as with homework. The intent was to create a process known as triangular bonding, where students and mentors all work together and help each other's understanding (Hughes, 2001). This help would take place over the course of two hours twice a week. It was the goal of the program to track student improvement through grade levels 6-8 using student grades and state assessment data. An over-arching goal was to provide the student with a viable role model who might spark college aspirations.

The Middle School Sites:

All of the middle school program sites selected by the colleges and universities have what Jones (1991) stated as a high number of students performing below grade level. Such a composition is needed to be involved in the program and in order to make running the program worthwhile for the Foundation. Additionally, it was made clear that the location of the program should be readily accessible so that the mentors could engage their students effectively (Hughes, 2001). Each of the three middle schools is in an urban area. The students were 6-8th graders. School A has 800 students, school B has 380 students and school C has 800 students.

Selection of Students:

The middle school students were at-risk who performing below grade level at the time of their selection, for whom an intensive short-term program would be most academically effective and cost-effective. Students who were language challenged would be placed in a triangulated mentoring format to provide a "buddy" system for sharing resources and learning cooperatively. In order to contextualize the data some basic characteristics of the mentees are presented in **Figure 1**.

Selection of Mentors:

The mentors were chosen according to their ability to demonstrate leadership and solid academic qualities at the university level (Hughes, 2001). In an effort to provide the students with an incentive for participating in the academic mentoring program the student mentors received enrollment in a seminar course for free. Additionally, students received a scholarship grant. Figure 2 illustrates the number of participants and breaks down each school's group in terms of male/female, ethnicity and grade level.

Mentor Training in the Jones-Zimmermann Model

Research indicates that few programs devote themselves to in-depth training for their mentors (Jekielek, 2002; Herrera, 1999). Because of this lack of support, mentors often feel compelled to end the relationship early because they are uncertain of what more can be done (Herrera, 2000).

As the program coordinators involved in the J-Z AMP began to plan the academic mentoring program, the need for mentor training was recognized. Each program site then became responsible for creating the mentoring program using the objectives stated in the original proposal, and developing a training program for the mentors. While there are competing theories on how people, and especially children, learn and retain new information, each of the mentor training programs had elements of the following:

- Cognitive Learning: age-appropriate and presented clearly and in a logical progression.
- Experiential Learning: giving mentees a chance to do something with the knowledge they just acquired. Building in chances to utilize new skills so that students will remember the concepts.
- Social Learning: creating the opportunity for mentees to learn with others. The triangulated setup of one mentor and two mentees supports this notion. Through group discussions and activities, mentees had the opportunity to share ideas, develop confidence, become contributing members of a group, and support their peers.
- Environmental Learning: the fact that learning does not take place in a vacuum. The culture, community, and personal history of the mentees influence their learning.
- Modes of Learning: a basic knowledge of learning styles: kinesthetic, visual, and auditory to help the mentor understand the importance of creating variety in training activities and to help reach children who are struggling to understand the concepts in your sessions, as well as keeping the training lively and interesting.

Summary

The Project's Research Design:

- To understand more fully the effect of academic mentoring on academic performance and school retention
- To observe and determine if there are behavioral and cognitive correlates of improved discipline and behavior
- To observe if the susceptibility of students to drop out of schools is decreased if supported by a mentor

The Program's Process:

The Mentor Model Elements:

- * Site Selection
- * Program Measurement
- * Student Selection
- * Mentor Training
- * Improvement/Assessment
- * Mentor Selection
- * Collaborative Planning

The Program's Structure:

The Program's Structure				
Mentor/Mentee	Good Character	Academic Ability		
Selection	At Risk			
Mentor/Mentee	Triangular Bonding	Gender Match		
Relationships	Role Models	Academic Focus		
Program Structure	Integrated Curriculum	2X Week, 2 hrs		
	Language Literacy	Mathematics		
Program Structure	On-site Program	Student Aspirations		
	Academic Success	Campus Experience		

Research Design Question Matrix

	Level of Cognition	Affective	<u>Evaluative</u>
Mentees	Was there intellectual growth	Did the mentees evidence	What issues did we have
	and success?	growth in academic	with mentees?
	Quantitative:	Confidence? How?	What are access about
	Standardized tests	Did the mentees evidence	what processes should
	Projects	Did the mentees increase in	
	<u>Qualitative:</u>	motivation for academics	How were the mentees
	leacher or parents	and other school-related	selected?
	comments. Are the	Did the montoon exhibit	How much time was spent
	How? Did some mentees	more interest in including	socializing with each student?
	not improve? Why?	their parent siblings or	
	not improve . Wily !	peers in greater success	What did the mentees like
		in academics?	best/least about the program?
		What was an excellent	1 5
		session? Why?	
		Did any mentees improve by	
		reducing or eliminating truancy	
		or discipline incidents?	
		Did the mentees feel that the	
Montoro	Mag there intellectual	Did the menters evidence	What difficultion did wa
Mentors	growth and success?	arowth in academic confidence?	have with the mentors?
	Was there professional	How?	have with the mentors:
	arowth?	Did the mentors evidence	What processes
	What experiences were	growth in self-esteem? How?	should be improved?
	learning experiences?	Did the mentors increase in	·
	Did the mentors keep a journal	motivation for academics and	How were the mentors
	or grades? What did these	other university related	selected and trained?
	indicate?	activities?	
	Will the mentors return next	Did the mentors share their	How much time was spent
	year? Did como montore not have	family?	socializing with each mentor?
	success? Why?	What was an excellent	What was the best thing
	How closely and often did	session? Why?	about the mentoring
	the mentors work with the	Did the mentors feel a	program?
	student's classroom teachers	sense of accomplishment?	
	and coordinators of the program?	Examples?	
Administrative	What is the educational	Did the team achieve	What staffing, space and
Team	experience and background	"buy in" for the program?	materials are necessary to
	of the team as it relates	HOW? Did the team feel a sense of	ensure the success of
	What skills or qualities are	Did the team leef a sense of	the program?
	assets for a successful team?	Did team members share their	What are the areas of
	Which team member's funtion	experiences with their families.	challenge for each member
	is the necessary "glue" for the	colleagues, and friends?	of the team to fulfill his/her
	program and team to be	How often did members of	role? (research problems,
	successful?	the team interact socially with	gate-keeping, etc.)
	How often did the team	with each other and the mentors?	
	members engage professionally?		On what levels and functions
			were the team most necessary
			What processes of the team
			should be improved?
			How was the team selected?
			What happened in the program?

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What worked best/least in running the program?

Partnerships	How much research is necessary before applying for a foundation's or partner's support? What difficulties are posed by partnerships? What opportunities do	What kind of results do the partners need to experience and feel? What confirms to the partners that the program is worthwhile and a success?
	What opportunities do partnerships offer?	

Which set of variables or ideas must we be attentive to in order to succeed?

FINDINGS

In the J-Z AMP Model of academic-based mentoring, mentees were selected by their proficiency scores in language arts and math and may also be referred by teachers from designated schools that could benefit from additional attention and guidance. Mentors then meet with referred youth in a triangulated "one-on-two" format, twice a week for two hours after school. Selected college-aged mentors earning a stipend commit to meeting with the child for at least twice a week for the three years of the program. Mentors and youth usually spend most of their time on schoolwork, but they also engage in other activities including sports, games, reading, and other group activities.

The research indicates that when indicators of improvement are developed to evaluate mentoring programs, mentoring behaviors that produced significant improvements are often the following:

- Mentors who interacted with the students daily
- Mentors who tutored students or supervised after school study sessions.
- Mentors who monitored academic success
- Mentors who elicited parent involvement.

The Jones-Zimmermann Model: The Six Goals

Given the strong interest in mentoring and the resource decisions that are involved with mentoring programs, it is useful to provide information about how the J-Z AMP Model actually operates, whether this program displays potential for effectiveness and what, if any, implementation challenges decision-makers and program operators should be aware of.

To explore these issues, and reflect upon the first three years of the implementation of the J-Z AMP Model, we addressed six main goals (in discussion order):

Goal 1: The program should develop an appreciation among college students for the teaching profession.

Year 1		Year 2		Year 3			
Year	#	%		#	%	%	%
# of Mentor	46			48		37	20
Male	4	8.7%		10	20.8%	13	35.1%
Female	42	91.3%		38	79.2%	24	64.9%
Ethnicity							
Caucasian	38	82.6%		34	70.8%	30	81.1%
Hispanic	5	10.9%		7	14.6%	4	10.8%
African American	3	6.5%		7	14.6%	3	8.1%
Remuneration Plans			\$10.00/Hr (Site 1) \$7.40/Hr (Site 2) \$3,000 Yr Stipend (Site 3), First Year; \$4,000 Yr Stipend, Second Year				
College Majors (Mos	t Resp	onses)	Psychology, History, Business, Mathematics, Education, Media Studies				
GPA			3.0 Mi	nimum	, Major: 3.3		
Experience (Most Re	spons	es)	Work S	Study,	Service Lea	rning, S	chool Volunteer
Work Load			2 hrs/2x Week with 2 mentees				

Goal 2: The program should provide an on-going source of trained academic mentors for local school systems.

Table 2: Mentee Charac	tensuc	S				
Vaar	Year 1		Year 2			Year 3
fear	#	%	#	%	#	%
# of Mentor	93		85		81	
Male	37	39.8%	34	40.0%	34	42.0%
Female	46	49.5%	51	60.0%	47	58.0%
Caucasian Hispanic African American	5.0% 34.0 56.0	% % %				
Other	2%	0				
School Sites		School A		School B		School C
Grade Levels	K-8		6-8		6-8	
Enrollment	800		380		800	
% Minority Students	40%		47%	>	87%)
Languages Spoken	Eng	lish, Spanish,	Ebonic	s, Haitian Cr	eole, Ch	inese
<u> </u>	150/		/10/		61%	

Goal 3: The Program should build self-confidence and positive social values in mentored students.

Table 3: Because Of My Mentor, I Feel More C	onfident In Myself.	
	Mentees	Mentors
Yes	55%	65%
No	8%	22%
More than before/Fine to begin with	0%	0%
Did not change/Don't know	37%	13%
Respondents	n=81	n=37

Goal 3: The program should build self-confidence and positive social values in mentored students.
Table 4: Because Of My Mentor, I Think I'm A Better Person.

	Mentees	Mentors
Yes	55%	38%
No	10%	0%
More than before/Fine to begin with	0%	27%
Did not change/Don't know	35%	35%
Respondents	n=81	n=37

Table 5: Because Of My Mentor, I Get Along B	etter With My Parents.	
	Mentees	Mentors
Yes	40%	39%
lo	5%	5%
lore than before/Fine to begin with	0%	30%
id not change/Don't know	55%	26%
Respondents	n=81	n=37

Goal 3: The Program should build self-confidence and positive social values in mentored students.

Table 6: I Feel My Mentee (Child) Thinks It's In	nportant To Try To Help Oth	ers.
	Mentees	Mentors
es	25%	34%
0	5%	32%
ore than before/Fine to begin with	47%	30%
d not change/Don't know	23%	4%
espondents	n=81	n=24

Goal 3: The program should build self-confidence and positive social values in mentored students.

Table 7: Because Of My Mentor, I Feel Better Talking With People.		
Mentees		
35%		
15%		
0%		
50%		
n=81		
-	Mentees 35% 15% 0% 50% n=81	

Goal 3: The program should build self-confidenc	e and positive social values in mentored students.				
Table 8: Because Of My Mentor, I Get Along Better With My Teachers.					
	Mentees				
Yes	37%				
No	13%				
More than before/Fine to begin with	0%				
Did not change/Don't know	50%				
Respondents	n=81				

Goal 4: The program should encourage middle school students to aspire to higher levels and to graduate from high school.

Goal 4: The program should encourage middle school students to aspire to higher levels and to graduate from high school.

 Table 9: Do You Want To Stay In School And Graduate From High School? (,,,Stay In School) (...Aspire To Higher Ed)

	Mentees	Mentors	Parents		
Yes	98%	75%	75%		
No	3%	0%	0%		
More than before/Fine to begin with	0%	17%	25%		
Did not change/Don't know	0%	8%	0%		
Respondents	n=81	n=37	n=24		
Composite responses to closely related questions () through multiple survey instruments.					

Goal 4: The program should encourage middle school students to aspire to higher levels and to graduate from high school.

Table 10: Because Of My Mentor, I Feel I Have More Options For My Future. (Set Goals)					
	Mentees	Mentors	Parents		
Yes	91%	64%	25%		
No	0%	4%	50%		
More than before/Fine to begin with	10%	7%	25%		
Did not change/Don't know	0%	25%	0%		
Respondents	n=81	n=37	n=24		

Goal 4: The program should encourage middle school students to aspire to higher levels and to graduate from high school.

Table 11: Because Of My Mentor, I Feel I Have A More Positive View Of My Future.				
	Mentees	Mentors		
Yes	85%	57%		
No	0%	7%		
More than before/Fine to begin with	0%	16%		
Did not change/Don't know	15%	20%		
Respondents	n=81	n=37		

from high school.	
Table 12: I Feel My Mentee Has Higher Expectations Of Him	n/Herself.
	Mentors
Yes	68%
No	7%
More than before/Fine to begin with	17%
Did not change/Don't know	8%
Respondents	n=37

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Goal 5: The program should remediate competency	y in two foundational skill	areas: language skills &				
mathematics-quantitative skills.						
Table 13: Do You Know Where To Go For Help With Homework?						
	Mentees	Mentors				
Yes	78%	77%				
No	0%	3%				
More than before/Fine to begin with 22% 14%						
Did not change/Don't know	0%	6%				
Respondents	n=81	n=24				

Goal 5: The program should remediate competency in two foundational skill areas: language skills & mathematics-quantitative skills.

Table 14: Because Of My Mentor, My Grades And Test Scores Are Better.						
Mentees	Mentors					
55%	57%					
13%	11%					
9%	17%					
23%	15%					
n=81	n=24					
	Test Scores Are Better. Mentees 55% 13% 9% 23% n=81	Mentees Mentors 55% 57% 13% 11% 9% 17% 23% 15% n=81 n=24				

Goal 5: The program should remediate competency in two foundational skill areas: language skills & mathematics-quantitative skills.

	Mentees	Mentors	
Yes	47%	77%	
No	4%	0%	
More than before/Fine to begin with	0%	15%	
Did not change/Don't know	49%	8%	
Respondents	n=81	n=24	

Table 16: Mentee Ac	hieven	nent: Read	ing Grad	de Analysis					
Year	Site 1		Site 2	2	Site 3	Site 3*			% Growth
	#	%	#	%	#	%	#	%	Stasis
Reading First Year									
Growth	8	24.2%	17	51.5%	N/A	N/A	25	37.9%	
Stasis	13	39.4%	12	36.4%	N/A	N/A	25	37.9%	75.8%
Loss	12	36.4%	4	12.1%	N/A	N/A	16	24.2%	
N=	33		33				66		
Reading Last Year									
Growth	20	64.5%	8	36.4%	5	33.3%	33	48.5%	
Stasis	4	12.9%	10	45.5%	4	26.7%	18	26.5%	75.0%
Loss	7	22.6%	4	18.2%	6	40.0%	17	25.0%	
N=	31		22		15		68		

Table 17: Mentee	Achiev	/ement: Mat	hematic	s Grade An	alysis				
Year	Site	1	Site	2	Site 3	*	Tota		% Growth
	#	%	#	%	#	%	#	%	Stasis
Math First Year									
Growth	7	21.2%	20	60.6%	N/A	N/A	27	40.9%	
Stasis	14	42.4%	11	33.3%	N/A	N/A	25	37.9%	78.8%
Loss	12	36.4%	2	0.1%	N/A	N/A	14	21.2%	
N=	33		33				66		
Math Last Year									
Growth	13	41.9%	2	9.1%	7	46.7%	22	32.4%	
Stasis	15	48.4%	15	68.2%	1	6.7%	31	45.6%	78.0%
Loss	3	9.7%	5	22.7%	7	46.7%	15	22.1%	
N=	31		22		15		68		

Year	Site	1	Site	2	Site 3	*	Tota	l	% Growth
	#	%	#	%	#	%	#	%	Stasis
GPA First Year									
Growth	23	67.6%	21	63.6%	N/A	N/A	44	65.7%	
Stasis	5	14.7%	0	0.0%	N/A	N/A	5	7.5%	73.2%
Loss	6	17.6%	12	36.4%	N/A	N/A	18	26.9%	
N=	34		33				67		
GPA Second Year									
Growth	0	0.0%	16	59.3%	N/A	N/A	16	27.1%	
Stasis	26	81.3%	4	14.8%	N/A	N/A	30	50.8%	77.9%
Loss	6	18.8%	7	25.9%	N/A	N/A	13	22.0%	
N=	32		27				59		
GPA Third Year									
Growth	16	47.1%	7	31.8%	6	46.7%	29	40.8%	
Stasis	14	41.2%	3	18.8%	3	6.7%	20	28.2%	79.0%
Loss	4	11.8%	12	75.0%	6	46.7%	22	31.0%	
N=	34		22		15		71		

Goal 5: The program	should reme	diate competer	ncy in two fou	undational skill area	as: language skills &
mathematics-quantitativ	/e skills.	-	-		
Table 19: Mentee Achie	evement: Con	nposite Grade A	nalysis v. Com	nparison Group	
Year		Site*		Comparison	%
	#	%		Group	Difference
GPA First Year					
Growth	23	67.6%			
Stasis	5	14.7%	82.30%	66.7%	+18.9%
Loss	6	17.6%			
N=	34				
004.0					
GPA Second Year					
Growth	0	0.0%			
Stasis	26	81.3%	81.3%	79.8%	+1.8%
Loss	6	18.8%			
N=	32				
GPA Third Year					
Growth	16	47.1%			
Stasis	14	41.2%	89.3%	80.0	+10.4%
Loss	4	11.8%			
N=	34				
*Site chosen for largest	number of co	ntinuing Mentor	r and Mentee r	elationships over thr	ee years.

Goal 5: The program shou mathematics-quantitative skil	ld remediate compe Is	etency in two foundational skill a	reas: language skills &
Table 20: Mentee Achieveme	ent: State Mastery Te	ests For Math Scale By Rank Order	r (CT)
	Site 1**		Site 2
Math Mastery Test*		Math Mastery Test	
State Mean	255.9	State Mean	255.9
Mentees	242.4	Mentees	239.7
City Mean	228.6	City Mean	225.9
Free/Reduced Lunch	225.9	Free/Reduced Lunch	224.5
Hispanic (City)	224.5	Hispanic (City)	222.5
African-American	221.3	African-American	221.3
ESL	216.3	ESL	216.3
* CT Mastery Tests Scores: 2	002 v 2001 Categor	y Mean Score	
** CT Sites Only	•		

Goal 5: The program should remediate competency in two foundational skill areas: language skills & mathematics-quantitative skills.

Table 21: Mentee Achievemen	t: State Mastery T	ests For Reading By Rank Order (C	T)
	Site 1		Site 2
Reading Mastery Test*		Reading Mastery Test	
State Mean	253.0	State Mean	253.0
Mentees	240.5	Mentees	243.7
Comparison Group	232.8	Comparison Group	224.7
City Mean	218.8	City Mean	218.8
Free/Reduced Lunch	218.8	Free/Reduced Lunch	218.8
Hispanic (City)	218.6	Hispanic (City)	215.1
African-American	215.1	African-American	201.7
ESL	194.4	ESL	194.4

Goal 5: The program	should remediate	competency in two for	oundational skill a	areas: language skills &			
Table 22: Mentee Achievement: % Performing At Or Above Expected Mastery Test Score (CT)							
Math	Site 1	Difference	Site 2	Difference			
Mentees (Year 2)	48.8%		58.0%				
City (Year 2)*	31.0%	+17.8	45.0%	+13.0			
City (Year 1)	25.0%	+23.8	36.0%	+22.0			
Reading							
Mentees (Year 2)	53.7%	58.0%					
City (Year 2)*	30.0%	+23.7	35.0%	+23.0			
City (Year 1)	25.0%	+28.7	33.0%	+25.0			
* Refers to resident site	e city.						
Goal 5: The program mathematics-quantitativ	should remediate	competency in two fo	oundational skill a	areas: language skills &			
Table 23: Mentee Achie	evement: Standardiz	zed Reading Inventory	Scores For Site 3	(MA)			
Reading	Site 3	School		Difference			
Fall, 2001	765.3	786.7		-21.4			
Winter, 2002	773.5	834.3		-60.8			
Fall, 2002	849.4	857.4		-8.0			
Winter, 2003	952.9	930.8		+22.1			

Goal 6: The program should reduce high school "drop out" rates.

Goal 6: The program should reduce high school "drop out" rates.						
Table 24: Do You Like School? (Does Child Like School)						
Mentees Mentors						
Yes	43%	50%				
No	42%	25%				
More than before/Fine to begin with	14%	25%				
Did not change/Don't know	1%	0%				
Respondents	n=81	n=24				
Composite responses to closely related of	questions () are utilized due to multiple survey instruments				

Goal 6: The program should reduce high school "drop out" rates.				
Table 25: Because Of My Mentor, I Come To School More Often.				
	Mentees	Mentors		
Yes	27.5%	89%		
No	5%	1%		
More than before/Fine to begin with	0%	15%		
Did not change/Don't know	68.5%	11%		
Respondents	n=81	n=24		

Table 26: Because Of My Mentor, I Like Schoo	I More.	
	Mentees	Mentors
Yes	35%	57.3%
No	22.5%	7.1%
Nore than before/Fine to begin with	0%	19.6%
Did not change/Don't know	65%	0%
Respondents	n=81	n=24

Summary

Findings: Mentees

- Improved academic performance (indicated by higher report card grades)
- Increased attendance rates
- Higher educational aspirations
- Better attitudes about school
- Enhanced self-esteem and self-confidence

Findings: Mentors

- Friendships with young people
- Connections with youth
- The satisfaction of having contributed to the community
- · Opportunities to enhance personal strengths and develop new skills
- Thinking more about teaching

Findings: Parents

- Increase Community support-through mentors who often become school advocates;
- The community gains a better understanding of the challenges students, teachers, and schools face
- The community becomes more aware of students' accomplishments and achievements

Findings: Communities

- Opportunities to further develop partnerships with businesses and community organizations
- Improved image of the school in the community
- Knowledge of school programs and other educational opportunities
- Better attitudes about school
- Enhanced self-esteem and self-confidence

Summary of Research Design: Product/Data Matrix

Mentees	Level of Cognition Intellectual growth and success Quantitative:	Affective Growth confide	<u>e</u> in academic nce	<u>Evaluati</u> Challen	<u>ve</u> ges to production
	Standardized tests. Grades.	Growth	in personal	Time or	n task/session
	Homework, Journals, Projects	confide	nce/self-esteem	structur	es
	Qualitative: Mentor, teacher or parent	Motivati and sch	on for academics	Time w	th socializing
	Comments, best work/	Relatio	nships and	Retentio	on/discipline/truancy
	Improvement description	feelings	re: mentors	Succes	sful/unsuccessful sessions
Administrative Team	Intellectual growth and success	Growth and cor	in leadership nfidence	Difficulti	es with people/program
	Important learning experiences Interviews and skill assets	Growth confide	in personal nce/self/	Best pr	actices sessions
	Best work/improvement	esteem		Staffing	space, materials
	Background of study,	Motivati	on for	0	
	pertinent research	teachin	g/mentoring	Relatior	ship with university
	Clarification of goals,	Relation	nships and/or	and sch	lool
	reassessment	feelings	6	Goals a	nd direction of process
		Sense	of accomplish-		
		Feeling	s of frustration/		
		challen	ge		
Partnerships	Research and support for	Relatior	nships with univ-	Clarifica	tion of sets
	coalitions	ersity, s	chool, com-	of stake	holders
	Business and community	munity,	media	Commu	nication process
	laders insight	Measur	es of confidence		
	Opportunities for growth and and su		ccess		
	insights				
Research Desig	n: Process Matrix, Results, Recom	imentatio	ons		
	Level of Cognition		Affective		Evaluative
Mentees Important findings/learning experiences Specific and general observations Quantitative and Qualitative process		ences Ethnographic de criptions & narrat		S-	Further research
				tive	and improvement
		SS	of the findings of the		to the program's
			process		process.

Summary recommendations

Correlation and connections to other factors/influences

 Mentors
 Important findings/learning experiences
 Ethnographic des Further research and

 Specific and general observations
 criptions and narrative
 improvement to the

 Quantitative and Qualitative process
 of the findings of the
 program's process

 Summary recommendations
 Correlation and connections to the other factors/influences
 Ethnographic des Further research and

Administrative Important findings/learning experiences Specific and general observations Quantitative and Qualitative processes This study situated in larger review of Literature

Summary recommendations Correlation and connections to other factors/influences

Partnerships

CONCLUSIONS AND IMPLICATIONS FOR EDUCATION

Understanding how the growing number of "schoolbased mentoring" programs operate and their effectiveness will be critical in ensuring that programs like the J-Z AMP Model continue to benefit at-risk youth. It will also help determine where agencies and funders should invest their limited resources during this time of rapid expansion. If traditional mentoring programs do not provide youth with strong adult relationships that also contribute to their intellectual and social growth, resources may be better used to provide youth with a more focused, academically-based approach.

Mentoring programs need to have quality research based evaluations; therefore it is important that research studies such as this one are conducted.

Advocates of approaches like the J-Z AMP Model claim that academic-based mentoring has many benefits that make it a strong complement to the traditional community-based mentoring approaches. This happens in four ways:

- It may attract mentors who may wish to teach or have taught before in their academic field of expertise. This potential benefit is particularly important, given the difficulty of recruiting adult volunteers to other community-based mentor programs.
- Youth in community-based programs are typically referred to a mentoring program by a parent who takes the initiative to contact the agency and go through the application process. In school based mentoring, youth are referred to the program based

upon academic proficiency or lack thereof and are referred by testing scores or teachers instead of parents. This approach has the potential to reach youth whose parents lack the time, energy or inclination to involve their child in more intensive mentoring. Children from families facing extreme stress and crisis may not have this kind of advocate. Yet, these are the children who are in most need of the benefits that mentoring can provide.

- 3. Mentoring in the school context may enable staff to supervise matches more easily, effectively and inexpensively. Case management in community-based programs can be challenging because it is timeconsuming to contact families. When youth and mentors meet in one location, this process is simplified. Teachers and other school personnel can also assist with supervision. These factors make school-based mentoring programs less expensive than community-based programs.
- 4. School-based approaches link the mentor to the school and college environment, making education a salient part of the mentoring relationship. This may help mentors to foster a youth's academic improvement. If these hypothesized advantages can be turned into an operational reality, the number of children positively influenced by high-quality academic mentoring could be significantly expanded. Yet, because academic mentoring is relatively new, we know very little about these programs and whether they can begin to meet these expectations.

Improve future Relationships with university, school, parents, local community, media.

Clarification of sets of stakeholders, improved communication process.

Further research and improvement to the program's process.

Ethnographic descriptions and narrative of

the findings of the

process

A Final Note

In addition to measurable outcomes, the Jones Zimmermann Academic Mentoring Program had results that are somewhat difficult to measure, and the significance of these outcomes is as important to the success of the students and the program. One of these outcomes is hope.

Hope provides students with a "can do" attitudeby providing exposure and awareness of opportunities they have not realized. Hope provides a light at the end of the tunnel for most participants and their families. Hope also breaks down walls of mistrust and apathy, and helps the students set obtainable goals and become active members of the communities. Hope breaks down the vicious styles of intergenerational illiteracy, poverty, dropping out...It can be said that the J-Z AMP has become a catalyst for hope.

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Learning-Styles Based Homework Prescriptions Statistically Increased Attitude- and Standardized-Test Scores in Reading and Math for Underachieving Middle-School Students

- by Clifford B. Swezey

ABSTRACT

The author examined the effects of learning-styles based homework prescriptions versus traditional study-skills strategies on the achievement and attitudes of underachieving middle-school students in a New York City public school. Achievement gains were measured by the annual standardized examinations in English language arts (grade seven) or mathematics (grades six and eight) from one year to the next. Whereas each group experienced gains in achievement from the previous year, all experimental groups demonstrated statistically greater achievement gains using learning-style based homework prescriptions than any of the control groups.

Independent analyses of variance (ANOVAs) were employed to determine statistical significance when students were provided either of the two interventions. Data showed significant differences in achievement gains between the experimental and control groups in each grade on standardized examinations in reading and mathematics. Additionally, the experimental groups showed significantly more positive attitudes toward completing homework and studying with learning-style strategies than the students in the control group who used traditional-study methods. Significance was reported at the p<0.05 and p<0.001 levels. Effect sizes were large and very large. For grade 6, Cohen's d = 1.5; for grade 7, Cohen's d = 0.78; and for grade 8, Cohen's d = 0.95.

Since 2000, New York State has focused on elevating academic standards while placing increased importance on standardized testing to measure performance for all students. At the middle school level, the New York State standardized assessments became important criteria for grade promotion at a time when social promotion was being abandoned. With this in mind, I designed this study to investigate whether learning-styles based interventions would affect student achievement on these high-stakes standardized exams in English Language Arts (ELA) and mathematics.

Research Questions

For this inquiry, I addressed the impact of learningstyles awareness combined with individually generated homework prescriptions, versus traditional study-skills strategies, on the standardized-test performance and attitudes of underachieving middle-school students. I sought to answer the following questions:

- Would significantly higher mathematics and English language arts (ELA) achievement-test scores result when struggling students were provided homework prescriptions based on their individual learning-style strengths compared with when they were provided traditional study-skills strategies?
- Would significantly higher attitude-test scores result when struggling students were provided homework prescriptions based on their individual learning-style strengths compared with when they were provided traditional study skills?

The Dunn and Dunn Learning-Style

With more than 850 published studies conducted by researchers from more than 125 different institutions of higher education, support for the Dunn and Dunn learningstyles model as a successful intervention tool is abundant. This model incorporates 21 *elements* within five *stimuli* affecting each person's environmental, emotional, sociological, physiological, and psychological learning preferences (Dunn & Dunn, 1993) (**Figure 1**).

The Dunns (1996) repeatedly have documented that many people prefer to learn in ways that differ substantially from how others of the same age, class, gender, grade, nationality, or race prefer to do. How people master new and difficult academic information and skills is referred to as their individual learning style. A plethora of research using this model affirms that teaching with interventions congruent with individuals' learning-styles preferences results in statistically increased achievement and attitudes toward learning (Griggs & Dunn, 2007; www.learningstyles.net). Pertinent to this study, Geiser, Dunn, Deckinger, Denig, Sklar, Beasley, and Nelson (2001) compared the effects of using individual learning-styles based prescriptions versus traditional study skills on the classroom mathematics-test scores of 130 ethnically diverse average- and below-average eighth graders. An experimental- versus control-group design revealed statistically more positive assessment scores for students who had studied in ways congruent with their learning-style strengths. Those data were particularly impressive because there was no difference in the *frequency* of studying between the two groups. Therefore, the differences in achievement noted were attributable only to the learning-



style based strategies available to the experimental group. Not only were their attitudes toward studying and homework statistically better, but those students also revealed significantly more positive attitudes toward mathematics as well.

Similarly, Minotti (2005) found significant achievement gains in mathematics, English, social studies, and science after providing learning-style awareness training and homework prescriptions to students at a private, parochial middle school. In her experiment, Minotti tied achievement gains to report card grades. To differentiate my research from the works of both Geiser and Minotti, I tested the effects of learning-styles based homework interventions on standardized-test scores. Specifically, I examined student achievement on the New York State standardized examinations in ELA and mathematics. No other learning-styles study had measured achievement longitudinally according to student performance on these high-stakes standardized tests from one year to the next.

Participants, Instrumentation, Study Prescriptions, Study Tips, and Procedures

Participants

Subjects included 187 students attending a middle school in Queens, New York during one complete school year. The school had only 10.6% of its students eligible for free lunch, as opposed to more than 70% in most NYC schools. It served 1,185 students in grades six through nine, with a Special Education (SPED) population of 136 students and 58 English-Language Learners (ELL). Attendance rates were among the highest in the city, averaging 96.8% during the year. The students were ethnically diverse with 41% White, 7.8% Black, 8.6% Hispanic, and 42.6% Asian and Others. It also supported a 4.7% recent immigrant population mostly from China, India, and South Korea. In many ways, this school resembled neighboring suburban schools, so the results may be generalized to either urban or suburban environments.

Subjects were students whose scale-score performance on their previous year's standardized assessment was below proficiency (below Level 3). Sixth graders were chosen based on their Grade 5 standardized mathematics test results, seventh graders were chosen based on their Grade 6 standardized ELA (Reading) test results, and eighth grad-

ers were chosen based on their Grade 7 standardized mathematics test results. Since there were three grades involved and two major subject areas, I chose to examine reading effects in grade 7 and mathematics effects in grades 6 and 8. Thus, the sample consisted of 153 of the 187 identified students who, along with their parents, consented to be in the study and whose scale scores indicated that their previous-year's performance was at-or-below Level 2 (basic) on the respective subject examinations the previous year.

Instrumentation

To measure actual student gains on the particular standardized achievement tests before and after treatments, I used the following instruments:

- Learning Style Inventory (LSI) (Dunn, Dunn & Price, 2000) to identify students' learning styles on which to generate comprehensive individual homework strategies;
- New York State Mathematics and Reading Assessments (CTB/McGraw-Hill), the standardized assessments administered annually in grades 3-8 in New York State.
- Semantic Differential Scale (Pizzo, 1981) to measure each student's attitude toward the particular treatment after the study. This 12-question survey, each on a fivepoint Likert-type scale (total of 70 points), measured students' reactions to descriptive words, and thus, their attitudes toward the interventions.

Homework Prescriptions

Individual homework prescriptions were generated using the *Homework Disc* (Dunn & Klavas, 1990). Homework prescriptions generated from this disc offered specific suggestions for studying and completing homework assignments in ways congruent with each student's learning profile generated by the Learning Styles Inventory. For example,

students with a preference for dim light were advised to do their homework in subdued rather than bright illumination. Students whose learning profile indicated they would learn better with sound rather than in guiet were advised to study with background music or conversation (this could mean, for example, studying with a television on or in the family room). Students whose learning profile indicated they preferred intake while concentrating were advised to have a snack available while studying. All of the homework prescriptions specifically related to each student's preferences based on the 21 elements assessed by the Learning Styles Inventory (Figure 1). These prescriptions have recently become available at www.learningstyles.net for anyone who completes a learning styles survey on-line. It is worth noting that many of these prescriptive suggestions were incongruent with, and often counter-intuitive to traditional study strategies.

Study Tips Package

Students in the control group received 12 typical, traditional-type study tips with explanations. These strategies specified the need for conventional variables such as (1) getting organized, (2) studying in the same place, (3) studying at the same time, (4) keeping supplies organized and ready, (5) cutting out all distractions, (6) doing the hard stuff first, (7) scheduling long-term projects, (8) reviewing regularly, (9) scheduling each homework session, (10) studying in quiet and bright light, (11) avoiding marathons, and (12) not procrastinating. These tips explain that studying at the same time every day and utilizing a study area reflecting a formal design (sitting formally at a desk and in a chair) are the best ways to get the work done. They also place great emphasis on time management and organizational skills, as do most typical, traditional study suggestions (Jishka Homework Help, 2008).

Procedures

Students were identified in the fall based on their

performance on the previousyear's standardized assessments. Students' learning styles were identified using the Learning Styles Inventory and participants then were assigned randomly to either the learningstyles (LS) experimental group or the traditional study-skills (TR) control group. This yielded two groups in each grade, six, seven, and eight.

The LS groups then were given individual learningstyle homework prescriptions (Dunn & Klavas, 1990) based on their learning profiles. The TR groups received the traditional homework study-skills strategies. The LS groups received instruction about how to interpret their learning profiles and use their homework prescriptions while studying, while the TR groups received instruction about how to utilize the more traditional study strategies. Both packages contained a letter to the students and their parents and additional resources for them to investigate together.

Once a week over the approximately four-month intervention phase, I met with each group to discuss progress relative to how well students understood the respective strategies. Students were asked to write brief descriptions about the strategies they used as well as how they felt about them. Participants were encouraged to continue implementing the strategies outlined in their respective packages until the next annual standardized examinations were administered.

As a final gauge, participants received the *Semantic Differential Scale* (Pizzo, 1981) to measure their attitudes toward the respective treatments.

Results

Grade-Six Participants

Before treatments, the LS group of the grade-six cohort exhibited Level 2 performance or lower on the previous year's standardized mathematics assessment, with a mean mathematics scale score of 636. The TR group began with a Level 2 mean scale score of 646 before treatments. An analysis of variance (ANOVA) showed that the groups were not significantly different prior to interventions (p=.128). After treatment, the LS group achieved a mean scale score of 677 on the standardized mathematics assessment, yielding a gain of 41 points from the previous year. The TR group, on the other hand, achieved a mean scale score of 666 after treatment, for a gain of only 20 points from the previous year, based on the same assessments (**Figure 2**).



Thus, significantly higher mathematics achievement-test score gains resulted when underachieving sixthgrade students were provided learning-styles based homework prescriptions in contrast to when they were provided traditional study-skills strategies. Significance was established at the p<0.001 level.

	GRP	Ν	Mean	Std. Deviation	Mean Difference
Math Scale Score Gains	LS	23	40.87	15.913	21.13
	TR	23	19.74	11.647	
Attitude Scores	LS	23	54.26	3.236	22.26
	TR	23	32.00	8.279	

Table 1. Grade-Six Group Statistics



Pizzo's (1981) Semantic Differential Scale was administered after treatments (**Table 1**). The grade-six LS group reported a mean attitude score of 54.26. The TR group, on the other hand, reported a mean-attitude score of 32.00. Therefore, the grade-six LS group demonstrated significantly higher attitude-test scores than the TR group under the given treatment conditions (p<0.001). This indicated that struggling students who implemented strategies congruent with their learningstyle preferences had much better attitudes toward studying than those who used traditional study strategies.

Additionally, the sixth-grade scale-score cutoff for meeting the standards (Level 3) on the standardized mathematics assessment was 682. Of the LS group, 52% achieved or exceeded this score. In contrast, only 22% of the TR group met or exceeded this mark (**Figure 3**).

The effect size for this sixth-grade sample was very large (Cohen's d= 1.509). Computation of the gradesix effect size was based on the mean mathematics scale-

> score differences on the standardized assessments after treatments as reported in **Table 1**.

Cohen's
$$d = M_1 - M_2 / 6_{pooled} = (40.87 - 19.74) / v [(15.92 + 11.62) / 2]$$

An effect size of 1.5 is significant because it indicates that the mean scale-score gain of the LS group is at the 93rd percentile of the TR group.

Grade Seven Participants.

The achievement gains of seventh-grade students in this study were based on their reading scores. On the previous year's

standardized ELA assessment, the LS group from the seventh-grade cohort had a mean scale score of 653 (Level 2). The TR group began with a mean scale score of 655 (Level 2) based on the same standardized assessment the previous year. An analysis of variance (ANOVA) showed that these groups were not significantly different before treatments (p=.668). After treatment, the LS group achieved a mean scale score of 689 on the standardized reading assessment, yielding a gain of 35 points from the previous year. By contrast, the TR group achieved a mean-scale score of 678 after treatment, for a gain of only 23 points from the previous year (**Figure 4**).

Thus, NYS standardized ELA test-score gains were significantly higher for struggling seventh-grade students who were provided learning-styles strategies and homework prescriptions compared with those who were provided





traditional study-skills strategies. Significance was established at the *p*<0.01 level.

Attitudes toward doing homework were significantly better for this LS group as well (**Table 2**). The LS group reported a meanattitude score of 54.31 on the SDS. Conversely, the TR group reported a mean-attitude score of 30.29. Therefore, statistically higher attitude test scores resulted for the LS group than for the TR group of struggling students under the given treatment conditions, with significance established at the p<0.001 level.

Additionally, the seventh grade scalescore cutoff for meeting proficiency (Level 3) on the HEM-Reading Assessment was 685. Of the LS group, 64% achieved or exceeded this score, while only 33% of the TR group met or exceeded this mark after treatments (**Figure 5**). The effect size for this seventh-grade sample was large (Cohen's d=.78). Computation of this effect size was based on the mean mathematics scale-score differences on the standardized assessments after treatments as reported in **Table 2**.

Cohen's d = $M_1 - M_2 / o_{pooled} = (35.46 - 22.72) / v [(15.7² + 17.1²) / 2]$

d = 12.74 / 16.4 = 0.776

This effect size is significant because it indicates that the mean scale-score gain of the LS group is at the 79^{th} percentile of the TR group.

Grade Eight Participants.

The achievement gains of the eighth-grade cohort in this study were based on their mathematics-test scores.



	GRP	Ν	Mean	Std. Deviation	Mean Difference
Reading Scale	LS	28	35.46	15.694	12.74
Score Gains	TR	27	22.72	17.120	
Attitude Scores	LS	29	54.31	2.606	24.02
	TR	31	30.29	7.582	

 Table 2. Grade-seven Group Statistics

On the previous year's standardized mathematics assessment, the LS group had a mean-scale score of 668. The TR group began with a mean-scale score of 678 from the previous year (Figure 6). An analysis of variance showed that the groups were not significantly different prior to treatments (p=.05). After treatments, the LS group demonstrated much greater gains over the TR group, achieving a mean-scale score of 700 on the standardized mathematics assessment, a 32 point increase from the previous year. The TR group, on the other hand, achieved a mean scale score of 696, only 18 points higher than the previous year.

Thus, struggling eighth-grade students who were provided learning-style strategies and homework prescriptions significantly outperformed those who were provided traditional study-skills strategies on their NYS standardized mathematics assessment. Significance was established at the p<0.01 level.

Within this eighth-grade cohort, attitude-survey scores were also significantly higher for the group that received the learning-style interventions (**Table 3**). The results from Pizzo's (1981) Semantic Differential Scale show that the LS group had a much better attitude toward using learning-style strategies than the TR group had toward studying in traditional ways. The LS group reported a mean-attitude score of 51.52, compared to the TR group's mean-attitude score of only 31.32. Therefore, there were statistically higher attitude-test scores for the LS group than for the TR group under the respective treatment conditions. Significance was determined at the p<0.001 level.

The eighth-grade scale-score cutoff for meeting proficiency (Level 3) on the standardized mathematics assessment was 697. Of the LS group, 24% achieved or ex-



ceeded this score. By contrast, *none* of the TR group met this mark (**Figure 7**).

The effect size for this eighth-grade sample was large (Cohen's d= 0.950). Computation of the grade-eight effect size was based on the mean mathematics scale-score differences after treatments as reported in **Table 3**.

Cohen's d = $M_1 - M_2 / o_{pooled} = (32.68 - 18.32) / v [(17.639^2 + 12.073^2) / 2]$

An effect size of 0.95 is significant because it indicates that the mean scale-score gain of the LS group is at the 83^{rd} percentile of the TR group.

Student Comments

Students responded differently to the two interventions. The LS students commented:

"Wow, I really like studying with the music on!"

• "How come my mom never let me sit on the floor to do my homework?"

• "Today I studied in dim light. I like it much better because the bright light hurts my eyes."

On the other hand, the TR group made statements like:

- "This week, I made sure that I did my homework the same time every night. It seemed to be helpful."
- "This week I made sure my supplies were organized. "
- "I made a schedule and tried to follow it."

The obvious disparities in the tone of students' comments reflected the significantly more positive attitudes of the LS students displayed in the results.

Discussion

Controversy concerning homework normally centers on the *amount* and *quality* of homework students are given,

	GRP	Ν	Mean	Std. Deviation	Mean Difference
Math	LS	25	32.68	17.639	14.36
Scale Score Gains	TR	22	18.32	12.073	
Attitude Scores	LS	25	51.52	6.097	20.2
	TR	22	31.32	8.758	

Table 3. Grade-8 Group Statistics

rather than on the *conditions* under which students complete their homework assignments. Most of those engaged in these arguments seem to agree, erroneously, that students should complete their homework in a formal setting with bright light, seated at a table or desk, at a certain time of the day, without disruptions or distractions such as sound, television, radio, drinks or snacks, and by completing one assignment at a time.

However, several learning-style researchers have reported statistically increased achievement when students were made aware of their learning-style preferences and followed particular homework prescriptions based on those inclinations (Brand, 1999; Geiser, Dunn, Deckinger, et al., 2001; Geiser, 2003, Minotti, 2005, Shea Doolan, L. 2007). Such considerations apparently made students' experiences while doing homework more enjoyable and efficient as well. Marino (1993) urged that, "A school can do much to change the homework cycle of futility into a productive, even positive venture" (p.71).

Based on the findings of this research study, school systems that wish to focus on maintaining high expectations for all students should examine ways to improve individual performance by recognizing students' learning preferences and providing specific homework prescriptions responsive to those preferences. In this way, educators may raise the bar for all students—including underachievers. Finally, it is incumbent upon educators to seize every opportunity to validate those who learn differently. By moving beyond traditional interventions that work predominantly for the select few, we can meet the needs of non-traditional, underachieving students who *can and will* succeed under the right conditions.

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Ethical Challenges: Academic Integrity in Higher Education - by Maureen Tsokris

Institutions of higher learning have always been the gatekeepers for our nation's workforce, not only in corporate America but in professional education programs as well. Administrators in institutions of higher education work diligently to develop goals, mission statements and policies that adequately address their responsibility to provide the highest quality instruction to their students. High quality instruction includes not only the intellectual development of students but the personal and professional development of students as well. One of the most important roles of an educator is to assist students in developing a set of ethical standards that will guide their personal and professional decision making abilities as they enter the work force. This paper explores the degree to which academic dishonesty is occurring on our college campuses, why students are motivated to participate in unethical behavior and what faculty and administrators can do to maintain a high standard of academic integrity within their institutions.

A critical analysis of the literature reveals there is general agreement regarding student participation in academic dishonesty in our schools today. A growing consensus indicates that cheating in colleges and universities is endemic and not limited to a specific region, academic discipline or school. Research conducted by McCabe throughout the 1990's indicated that 64% of college students acknowledged cheating on exams or on written assignments. (McCabe, 2005) Similarly, Hutton (2006) reported statistics from the Center for Academic Integrity that indicated "more than 75% of students on most campuses admit to some cheating." (p.171) Although, Hutchins and Cobb (2008) suggested that studies of graduate students or those enrolled in professional programs (medicine and dentistry) demonstrated a lower incidence of cheating as compared to undergraduate programs, (approximately 56%), they believed this percentage was still unacceptable. In sharp contrast to these findings presented by Hutchins and Cobb; Austin, Simpson and Reynen (2005) presented some of the most startling findings regarding academic dishonesty in professional degree programs. Their study conducted at the University of Toronto's School of Pharmacy demonstrated that even those individuals seeking education at the professional level were participating, in large numbers, in various forms of academic misconduct. The results of their study showed, "More than 90% of students and educators admitted to involvement in one or more acts of academic dishonesty." (Austin, et al, 2005, p.148)

The literature suggests that acknowledging that students participate in academic dishonesty is not enough, it is important to understand that a student's perception of what constitutes academic dishonesty often differs from faculty perceptions. This means we need to recognize that there are numerous forms of academic dishonesty. Secondly, we need to understand what motivates a student to take part in academic misconduct. Lastly, we need to determine what role faculty members can play in upholding academic integrity in their institutions.

Students' perception regarding the various types of misconduct often influenced their decision to participate. The literature demonstrated that different forms of misconduct had different determinants for student participation. In her review of the literature, Hutton (2006) examined empirical studies and found different issues related to misconduct. Hutton found students cheat to achieve higher grades, out of laziness, because of pressures to succeed and because 50% of students surveyed did not believe cheating was wrong. Hutton suggested that most students were motivated by self interests and would make decisions based on the benefit versus cost trade off, which favored cheating. Hutton stated, that the benefit /cost ratio favored cheating because students believe there was a low probability of being caught, and faculty were reluctant to report student cheaters. Secondly, cheating most often was an unobservable behavior, making enforcement and punishment difficult. In addition, students were highly creative and often went to great lengths to conceal cheating. Hutton also found that when students developed strong inter-personal relationships, and they were more aware of the prevalence of cheating, and more accepting of the act, they were more likely to participate. She stated, "Cliques - strongly connected, directly linked, dense subgroups of similar people- tend to develop as the size of the network increases, and are positively related to the probability of unethical behavior." (Hutton, p. 173) Much of the research suggested that students today were more concerned

with the opinions of their peers, than that of the faculty or administration. As a result "student perception of peer disapproval is the strongest predictor of reduced cheating." (Hutton, p.172) In addition, Hutton (2006) found the ethical standards of a school community, school policies relating to misconduct, classroom environment, and instructor influence played a role in a student's decision not to cheat.

Throughout the 1990's McCabe conducted numerous studies related to academic integrity. McCabe compared the incidence of cheating at colleges and universities that had a Student Honor Code, with those institutions that did not have an honor code. Although his findings indicated schools with a student honor code had a much lower incidence of misconduct than schools without codes, the honor code was not the primary reason for the difference. McCabe found that student culture regarding academic integrity was a more important factor. In comparing his research from 1993, with that of Bowers research from 1964, McCabe suggested there was a significant increase in the amount of cheating occurring on college campuses. He stated "39% of students completing the 1964 survey acknowledged one or more incidence of serious test or exam cheating; by 1993, this had grown to 64%." (McCabe, p.27) McCabe questions whether this change reflects an actual increase in the amount of cheating occurring or whether it signifies a change in student attitudes regarding cheating. Perhaps more importantly, McCabe's research included comments made by students that suggested latter generations had a more lenient attitude in defining cheating. McCabe suggested that academic integrity must be a campus priority, and that responsibility for academic integrity should be placed on the students themselves. In reporting the results of earlier studies and those he conducted McCabe noted students were "troubled by the failure of their institution, and often its faculty, to address the issue of cheating." (p.26)

Similarly, Austin, Simpson and Reynen (2005) whose study was conducted at Canada's largest pharmacy school, found the big brother/big sister mentality developed in many professional schools played a significant role in creating situational opportunities for academic misconduct. Austin et al (2005) found the creation of these student roles often encouraged students to hand down old exams or to pass on laboratory results. Austin et al suggested; widespread rule breaking or academic misconduct can occur in community environments or organizations as a result of developing these close relationships. (2005)

Austin et al utilized a survey instrument that contained eighteen different scenarios, with questions specific to the various forms of academic dishonesty depicted in the scenario. The second part of the survey consisted of 35 questions regarding students' educational experience, including curriculum and their expectations upon completing pharmacy school. Their survey was completed by 85% of the faculty and 61% of senior level students. Although the results indicated both faculty and students admitted to a similar degree of academic dishonesty during their educational experience; opinions regarding the seriousness of these acts varied greatly between students and faculty. For example; they reported "students believed invention (or fudging) laboratory results were not very serious, while educators felt it was quite serious." (p.148)

Austin, Simpson and Reynen, (2005) delved deeper into the psychology of the individual and included Piaget's theories relating to cognitive development to explain why students engaged in academic misconduct. They suggested that Piaget's theories on assimilation (how children fit new information into what they know) and accommodation (how they change their beliefs when responding to the new information) were processes that students used to create their own understanding of what is right and wrong. Austin et al (2005) suggest social development along with moral reasoning and moral development are part of the formal educational process of young adults; as such the institution and faculty play a significant role in guiding this development. In addition they suggested "moral evolution may occur through participation in acts of, or in a culture within which academic dishonesty occurs" (p. 155) as such; "moral development must be preceded by the opportunity to act immorally." (p.155) Austin et al concluded the discussion of their results with the following judgment: if students do not have the opportunity to engage in academic dishonesty or to wrestle with the decision of whether to cheat or not, the development of the reasoning skills that are used during moral development may be stunted. (2005)

Bisping, Patron and Roskelley, (2008) evaluated 31 different forms of academic misconduct. The purpose of their research was to determine whether a specific set of variables influenced student participation in academic misconduct, and whether a student's perception of a behavior influenced the likelihood of them cheating. A misconduct survey was administered to students enrolled in introductory economics courses at a midsize public university from 2003-2005. The variables that Bisping et al (2008) considered that would influence a student's decision to cheat were: grade point average, probability of being caught and punished, the severity of the punishment, the age of the student, and the year in school (freshman, sophomore etc.) and the extent to which cheating occurred in the school. The survey utilized by Bisping et al was broken into three parts. The first part included basic demographic and background information. The second part of the survey asked the students what they believed constituted misconduct and whether they had participated in that specific behavior. The last part of the survey asked what factors affected the frequency of their misconduct. The results of this study indicated student's opinion and attitude varied greatly in regard to various forms of academic misconduct and their participation in each. Some of the questions included in the survey used by Bisping et al were: whether students copied from others during an exam, used cheat sheets, bought a paper from the internet, or allowed others to look at their test. According to Bisping et al the most frequently acknowledged forms of academic misconduct that students admitted to participating in were reading condensed versions of assignments, working in groups when assignments were meant to be completed alone, and having a paper professionally edited when grammar was being graded. Bisping, et al also found that the propensity to cheat increased when a student had a lower grade point average, when they believed others were cheating or they saw others cheat, if they belonged to a sorority or fraternity and when one or more of their parents had a college education. The incidence of cheating was also higher among students who drank. Although this study by Bisping, Patron and Roskelley was conducted on a small scale and only 262 students participated, it does offer some interesting conclusions that applied on a broader scale.

According to McCabe, it takes a whole campus community to educate our students today; that community includes the administrators as well as the faculty. He believes that students need to hear from the top down, from the president, the provost, the academic deans, and the faculty that they are adults who respect the learning process and do not cheat. "It is a challenge to develop students who accept responsibility for the ethical consequences of their ideas and actions." (McCabe, p.29)

The literature suggested, a number of important areas in which faculty could influence a students' opportunity and desire to cheat. Hutton (2006) stated students were less likely to cheat if they believed the instructor was concerned about their students and was taking steps to maintain academic integrity. Developing strong relationships between faculty and students significantly decreased cheating. Establishing and promoting academic integrity as a social norm was also a factor in reducing academic dishonesty. Hutton also suggested faculty should overcome their hesitancy to report cheating, and that they should reduce the opportunity to cheat by increasing the probability of being caught. For Hutton, reducing opportunities to cheat included using several proctors for testing, creating several versions of exams, or using exams with less multiple choice questions. Similarly, McCabe recommended faculty not recycle old exams, that they consider using plagiarism software, and that they should institute stronger punishments for those caught cheating. "Students believe that if the faculty is not concerned with cheating than it must not be important....faculty must recognize and affirm academic integrity as a core institutional value." (McCabe, p.29) It is the role of the instructor "to provide a learning environment that minimizes the opportunity to engage in academic dishonesty, even if it is only out of fairness to honest students." (McCabe, p.30)

Bisping, Patron, Roskelley (2008) stated it is important to educate students regarding what constitutes academic misconduct, and instructors need to design their courses in a manner that deters cheating. Academic dishonesty can be viewed as an educational opportunity. In order to reduce academic misconduct students need not only to understand that the act is misconduct, but they must also be convinced that the probability of being caught is high.

In conclusion this critical analysis of the literature indicates, not only is academic misconduct occurring, but is widespread and pervasive. Faculty attitudes, actions and behavior can play a significant role in reducing academic misconduct. Promoting academic integrity as the social norm, educating students as to what constitutes cheating, being more vigilant and less hesitant to report acts of misconduct and finding a balance between punishment and proactive strategies all contribute to reducing opportunity for students to engage in academic misconduct. McCabe stated "any campus that has not reviewed its integrity policies for some time is derelict in its responsibilities to its students and likely has a degree of discontent among its faculty." (p.31) Educators and administrators must keep in mind the significant role they play not only in the intellectual development of students but in the personal and professional development of their student body as well. Therefore, it is imperative that administrators and faculty take serious their role in assisting students in the development of a set of ethical standards that guide students as they become members of our nations workforce. Schools, administrators and faculty must actively provide for academic integrity among their students or they may be operating an unethical practice.

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