Curriculum and Testing Strategies to Maximize STAAR Achievement

By

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Abstract:

   The 2001 No Child Left Behind (NCLB) legislation has been the most far-reaching federal legislation in over four decades. To address these legislative mandates, this presentation will examine the third-generation correlates of the effective schools literature (based on one-half million studies) and review strategies the presenter (a patentee in chemistry) has used in his secondary school classes to achieve outstanding state test results. This presentation would not be complete without considering the achievement of special-population students in our schools. The session applies to all junior and high school STAAR testing.
Note: Following the power-point slides that immediately follow, the authors will provide additional comments.

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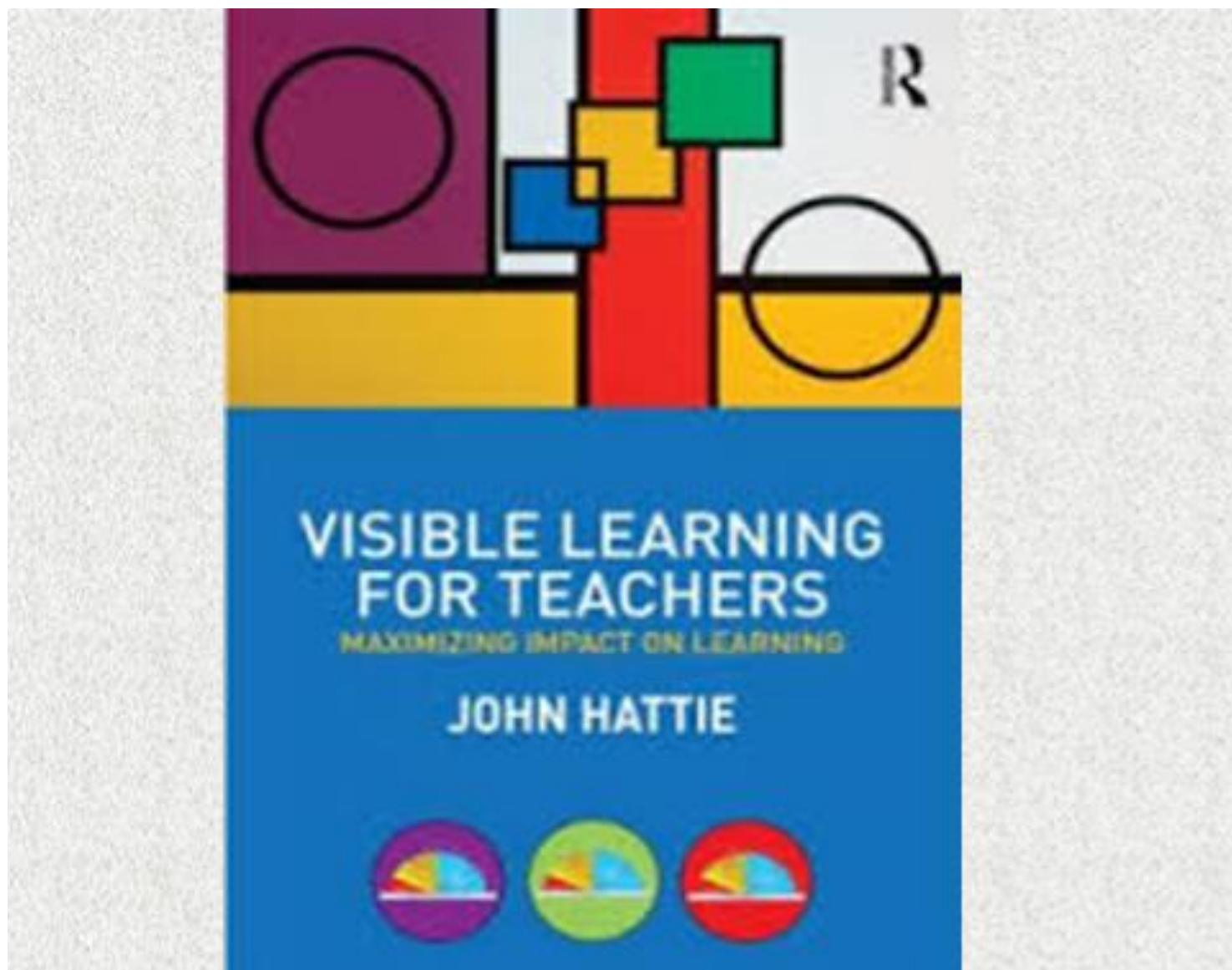William.johnson@tylerisd.org

Chantilly Ballroom East
CAST State Conference
Dallas, Texas
November 20, 2014
10-11 AM

How to Build a Classroom Culture

o Class is set up so all students can succeed [ES=.521]

o Students are engaged [ES=.617]

o Greet students at the door between classes

How to Build a Classroom Culture(cont.)

o Seat alphabetically to learn names

o Call roll orally so students learn each others' names

o Identify class leaders: win them over

How to Build a Classroom Culture(cont.)

o Stay in touch with the parents

o Put daily academic agenda on the board

o Great teaching comes from:
   o Passion of the teacher
   o Engagement of the student

The Great Teachers

- Story tellers
- Know their discipline
- Positive
- Made subject interesting
- Engaged students to think
- Relationships
- Two consistent traits of leaders
    - Ability to speak
    - Ability to connect emotionally

Visible Learning(2009)

> *What works to improve learning*

- Largest education study in the history of the world
- 15 years of research
- 800+ meta-analyses
- 52,637 research articles
- 150,000 effect sizes
- 240,000,000 students

VISIBLE LEARNING FOR TEACHERS

MAXIMIZING IMPACT ON LEARNING

JOHN HATTIE
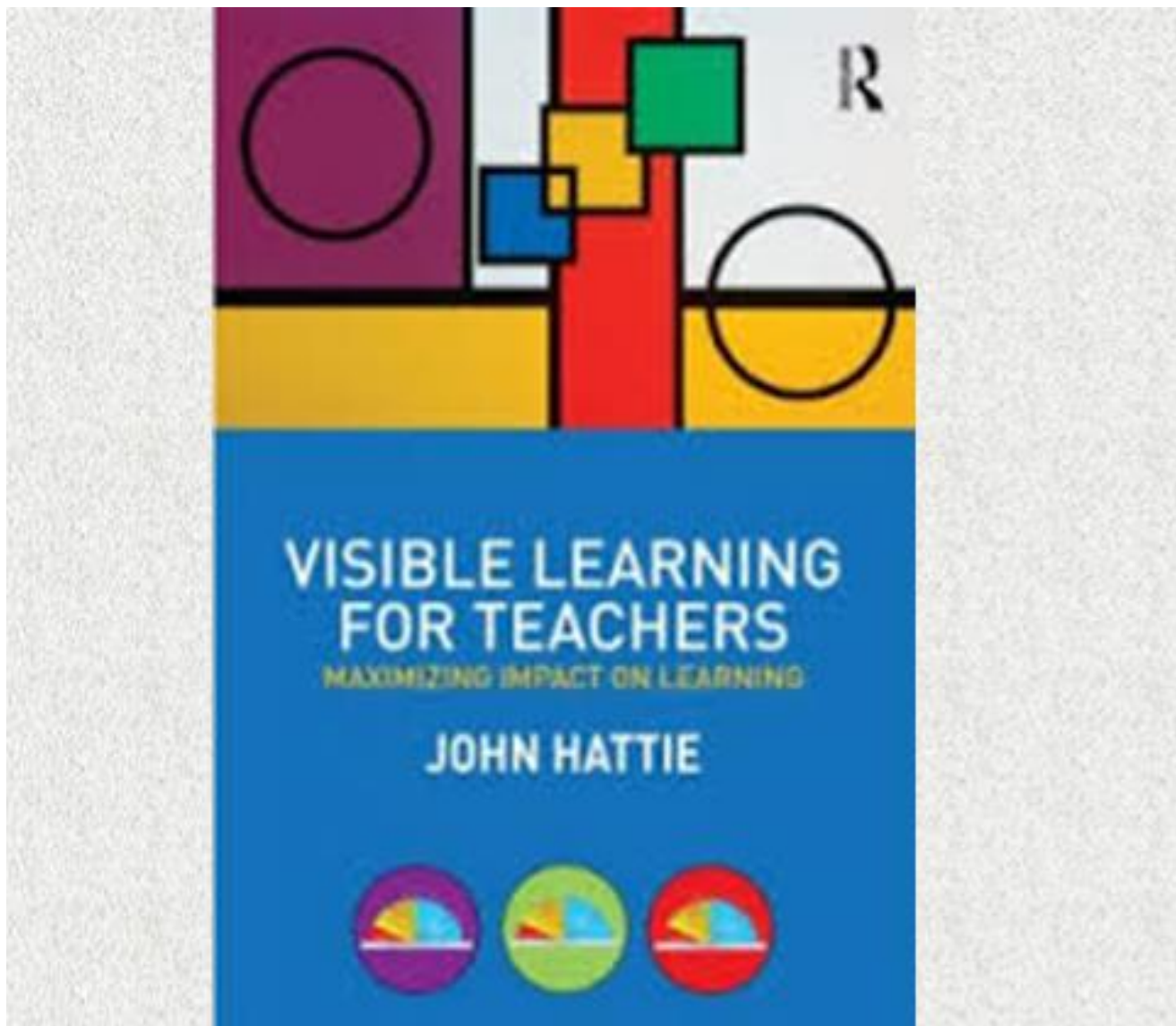
Visible Learning for Teachers Maximizing Impact on Learning(2012)

> *How to apply principles from his 2009 book*
> ○ 100+ meta-analyses added
> ○ 5,000,000 students added
> ○ 13,428 effect sizes added

How to Maximize Student Achievement:

○ Build Relationships with the Students

Identifying What Matters

▸ *Hattie's synthesis of 500,000 studies identified major factors in student achievement*

o Students	50%
o Schools/principals	5-10%
o Peers	5-10%
o Home	5-10%
o Teachers	30%

Classroom Rules

- o Rules should be reasonable

- o Rules should be objective

- o Use as few rules as possible

- o Be consistent with consequences for breaking rules
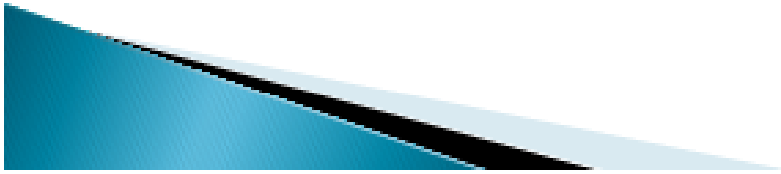
Ten Components to a Preventative Discipline Program

○ Inform pupils of what is expected of them
○ Establish a positive learning climate
○ Provide a meaningful learning experience
○ Avoid threats
○ Demonstrate fairness

Ten Components to a Preventative Discipline Program(cont.)

- Build and exhibit self-confidence
- Recognize positive student attributes
- Time the recognition of student attributes
- Use positive modeling
- Structure the curriculum & classroom environment

Students with Emotional Problems

- An inability to learn that cannot be explained by intellectual, sensory, or health factors.

- An inability to build or maintain satisfactory interpersonal relationships with peers and teachers.

- Inappropriate types of behavior or feelings under normal circumstances.

Students with Emotional Problems(cont.)

o A general pervasive mood of unhappiness or depression.

o A tendency to develop physical symptoms or fears associated with personal or school problems.

Some Characteristics Seen in Students with Emotional Disturbances

○ Hyperactivity (short attention span, impulsiveness)

○ Aggression/self-injurious behavior (acting out, fighting)

○ Immaturity (inappropriate crying, temper tantrums, poor coping skills)

Some Characteristics Seen in Students with Emotional Disturbances(cont.)

○ Withdrawal (failure to initiate interaction with others; retreat from exchanges of social interaction, excessive fear or anxiety)

○ Learning difficulties (academically performing below grade level)

Test Strategies

- Read question twice before answering
- Underline what is given
- Underline the question
- Answer short questions first
- Answer all the questions you can

Test Strategies(cont.)

- A good night's rest
- Free breakfast at school
- Bottle of water and small snack
- Decode the test
- What to do if you don't know the answer

$$P_i(\theta) = \frac{1}{1 + e^{-(\theta - b_i)}}$$

Equation 2.4 One Parameter Logistic model of Item Response Theory (IRT-1PL)

$$P_i(\theta) = c_i + \frac{(1 - c_i)}{(1 + e^{-a_i(\theta - b_i)})}$$

Equation 2.5 Three Parameter Logistic model of Item Response Theory (IRT-3PL)

This slide examined the use of Item Response Theory in STAAR test development. This approach to test development differs from classical test development, focusing on test-retest reliability, internal consistency, various forms of validity, and normative data and standardization. Modern test theory or Item Response Theory (IRT) focuses on how specific test items function in assessing constructs. IRT makes it possible to scale test items for difficulty, to design parallel forms of tests, and to provide for adaptive computerized testing (DeMars, 2010). See Thorpe and Favia (2012) for a discussion of data analysis using item response theory methodology.

As the slides show, the outline for the presentation was: Decoding the School; Decoding the Student, and Decoding the STAAR test. The fifth slide (How to Build a Classroom Culture) gave the effect sizes for building a classroom culture and then looked specifically at how to build a classroom culture. The next discussion (slide eight) focused on great teachers and their characteristics. This was followed by an introduction to John Hattie's Visible Learning (2009) and Visible Learning for Teachers Maximizing Impact on Learning (2012). Next was a discussion of Classroom Rules. Following were the Ten Components of a Preventative Discipline Program, Students with Emotional Problems, and Some Characteristics Seen in Students with Emotional Disturbances. This was followed by a discussion of Test Strategies and Item Response Theory (IRT) equations used in STAAR testing. Last is a general discussion of maximizing achievement for special education students. That discussion follows.

   The Education for all Handicapped Children Act (EHA), referred to as Public Law (PL) 94-142, was signed into law by President Gerald Ford in 1975. This legislation required all public schools accepting federal funds to provide equal access to education and one free meal daily for children with physical and mental disabilities. At the time EHA was enacted, more than one million children had no access to the public schools, and many states had laws that excluded public education for children who were deaf, blind, emotionally disturbed, or mentally

retarded. Another 3.5 million children attended the public schools but were "warehoused" in separate classrooms with minimal instruction.

Fifteen years later in 1990, President George H.W. Bush signed into law the Individuals with Disabilities Act (IDEA). The law governed how states and public agencies were to provide services to students, preschool through age 21, in 14 categories of disability. Since 1990, IDEA has been reauthorized and amended numerous times. Most notably, the Individuals with Disabilities Education Improvement Act of 2004 (IDEIA) offered greater flexibility to schools. It eliminated the requirement that students must exhibit a severe discrepancy between intellectual ability and achievement in order to be eligible for special education and related services as a student with a learning disability. Although comprehensive assessment was still required under the reauthorization act, increased flexibility gave districts the option of using Response to Intervention (RTI) procedures as part of the evaluation process for special education eligibility. This means that schools must carefully examine all the relevant aspects of a student's performance and history before concluding that a disability does or does not exist. The RTI approach has eliminated the "wait to fail" situation because students receive help promptly in the general education setting. It also has the potential to reduce the number of student referrals for special education services and has provided students with disabilities the Free Appropriate Public Education (FAPE) to prepare them for employment, further education, and independent living after graduation (Fasko, 2006; Klotz & Canter, 2006).

In the context of school districts serving their diverse student populations, recent Texas Education Agency statistics showed the 2013-2014 student enrollments in Texas public schools surpassed five million. Special needs groups included nine percent special education students, 900,476 LEP (ELL) students, 521,591 bilingual students, and 357,635 ESL students. There were also more than three million Texas students (60.3%) from economically disadvantaged families. All of these groups would include greater-or-lesser numbers of special education students needing special education services. When one considers these statistics,

several questions arise. One wonders if teachers can provide exemplary special education services for all the qualifying students in these groups and if there is research showing educators how to accomplish these tasks? This is our next discussion.

 What Works for Special Education Students

   John Hattie's recent book, Visible Learning for Teachers: Maximizing Impact on Learning (2012), is based on his 15 years' research synthesis of more than 800 meta analyses of 50,000 research articles, 150,000 effect sizes, and 240 million students. His research is the largest study of education in the history of the world, and he has identified what actually works in schools to improve learning for all students, including special education students. On the basis of his research in special education settings, Hattie (1992) found that special education students could achieve as much (as a consequence of teaching) as "normal" students. His research was based on a synthesis of 4277 research studies and 8545 effect sizes. He also found that the teaching strategies that worked with "normal" students also worked with special education students, and it was teachers (not curriculum, programs, or government policies) that made the difference in student achievement.   Grissom, Loeb, and Master (2013) found that the time spent on informal classroom walkthroughs negatively predicted student growth.

   In 2003, Hattie explicitly listed the similar factors that worked best for both "normal" and special education students. These included innovation, feedback, shorter intensive programs, and what he called the criticalness of the teacher. He noted that innovation, the teacher's constant attempt to improve the quality of learning, was the theme underlying most student success. Hattie noted too that feedback did not mean intensive testing because teachers could miss much of what students know, can do, and care about. Instead, teachers' feedback should be on how and why students understood or misunderstood the content being taught and what they needed to do to improve. He also noted he was coming to realize that feedback was more about what the students were telling him than what he was telling them. Last, criticalness of the teacher refers to the teacher's

effects on instructional quality. According to Hattie, what students bring to the classroom accounts for 50% of the variance of achievement; but even so, 30% of the variance is teacher competence.   The Bill & Melinda Gates Foundation (2013) released the culminating findings of their three-year study, Ensuring Fair and Reliable Measures of Effective Teaching, showing what all of us in education have always known: good teachers make a considerable difference.   Next, let's consider what the federal government is planning.

Evaluation of Special Education to Change

   Wide graduation-rate gaps between students with disabilities and those without disabilities has continued to draw the attention of the United States Department of Education. Thus, in 2015 the Education Department will evaluate states on their adherence to IDEA legislation. It is expected that the focus will shift from compliance (e.g., are diagnosticians completing students' IEPs) to examining special education graduation rates, dropout rates, and other performance indicators like special education growth models. The U.S. Department of Education has already informed states that special education assessments based on modified standards cannot be used for accountability purposes. To document that our mainstreamed special education students had achieved or not achieved at a level equivalent to the non-special education students, we calculated each special education student's Z-score from his-or-her six weeks and semester grades. If the Z-score was within plus-or-minus one standard deviation of the class mean of the non-special education students, this was one performance indicator we used to document achievement equivalence. We also used the SPSS 21.0 bootstrap analysis of n = 1000 random samples to calculate a 95% confidence interval for upper-and-lower range Z scores for each special education student. If the student's Z-score was within the 95% confidence interval, we did not reject the null hypothesis of no difference (Meyers, Gamst, & Guarino, 2006). To estimate the band of scores around our passing test grade (cut-point) for our benchmark tests, we also calculated the standard error of measurement (SEM).

   This academic year, the authors will calculate individual effect sizes for each

class and each special education student since effect sizes highlight the importance of the magnitude of score differences and growth. This is contrary to the usual emphasis of statistical significance since effect sizes partial out mean effects. Various authors have explained effect sizes and how they can be calculated (Becker, 2009; Coe, 2002). Johnson and Johnson (2012) noted that desired effect sizes are those above 0.40 and are attributable to specific interventions. The authors also accessed our special education students' permanent records and recorded pertinent data on each student. As Hale, Naglieri, Kaufman, and Kavale (2004) noted, we also found that students' standardized test scores were very helpful in understanding each student's strengths and weaknesses, how each one learned, and how to work with each student.

One hundred and Fifty Influences on Student Achievement

   Since Visible Learning was published in 2009, Hattie has added another 100+ meta-analyses to Appendix B of his 2012 book. However the overall ranking of the influences on student achievement has changed negligibly between the two versions (r > 0.99 for both rankings and effect sizes). The underlying messages as well have not changed. Appendix C of his 2012 book rank ordered the 150 influences that have had the greatest effect size on student achievement. Interestingly, about a half-dozen of the 150 influences refer to programs unknown in the United States or specifically to subgroups like special education that are not applicable to all students. For example, the number two influence on student achievement is "Piagetian programs." However, these programs are not used extensively in the United States. "Response to intervention" (effect size 1.07) is number three on his list (discussed earlier), and Hattie's "Comprehensive interventions for learning disabled students" (effect size 0.77) is his number eight influence. Both are top strategies used in special education instruction. According to Hattie (2012) and Hattie and Timperley (2007), feedback is also one of the most powerful influences on learning and achievement. See Waack (2013) for a glossary of Hattie's top ten influences on student achievement.   Interestingly, "Home

environment" and "Socio-economic status" are numbers 44 and 45 on the rank-ordered listing of the 150 influences. In other words, dozens of influences have greater effect sizes than students' backgrounds. What does this say about the fatalism that these special education students cannot learn?

Hattie notes the biggest mistake teachers make is focusing too much on testing and test scores and focusing too little on learning.   His number 83 influence, "Frequency/effects of testing," has an effect size of 0.34 (below the 0.40 desired effect size). Furthermore, special education assessments based on modified standards can no longer be used. Overall, test-driven accountability has increasingly lost legitimacy in the eyes of parents, educators, and lawmakers.

Effect of School Variables on Special Education Students

In his 2012 book, Hattie's research showed that some school variables like buildings, school size, and curriculum were among the least beneficial influences on student achievement. Yet these influences still seem to dominate our debates. We like to talk about things that really don't matter, such as all the structural things and the way schools are organized. The most powerful effects, however, are related to features within the school: the climate of the classroom, peer influences, and the lack of disruptive students. Excellent teachers know how to build classroom climates. We have seen these teachers greeting students at their classroom doors between classes and seating them alphabetically so they can quickly learn their students' names. They also identify their class leaders. If a new student seems lost, teachers know from research that one friend is what's needed for the student to fit in. The great teachers can identify the most important ways to represent the subjects they teach. That's why they are great teachers. However, they are also keenly aware that learning is primarily a social activity. Learning is all about building relationships, but don't forget that the intent is to build classroom cohesion and set the tone for student engagement, persistence, and learning (Hattie, 2012, 187). A classroom climate is critical for special education students, and that is why school features have such large effect sizes.

Summary and Conclusion

Following the basic Athenian ideas about education, not much changed for the next 2000 years. But in the last few decades, researchers have begun conducting real, evidence-based research on what really works in school, teaching, and learning.   With several thousand Texas students not on track to graduate each year, the content of this article will be very useful to school administrators as they plan teacher professional development activities in what actually works in schools to improve learning. School leadership is also evidenced by the administrative support of professional learning communities (PLCs) as the PLCs provide special education direction in the following areas: instructional strategies; student performance and growth indicators using statistics previously discussed in this article; defining how much progress over what period of time will be the benchmark for successful intervention; and involving parents and partners in these processes. The faculty partners or representatives from across general and special education should meet with the PLCs to discuss strategic matters pertaining to their shared special education students. We have also included Table 1: Teacher Accommodation-Modification Summary Sheet. This form summarizes the accommodations and modifications given in each special education student's individual education plan (IEP). Every teacher with special education students should complete a form like this and use it daily and in ARD meetings to summarize what is being done in class for his or her special education students. What we have discussed in this article is supported by the largest education study in the history of the world and has provided an extensively documented research base for school improvement. Throughout this document, we have also continually noted the research findings pertaining to special education students. As Hattie (2012) concluded, "the quality of teaching makes all the difference."

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Table 1   <u>Teacher Accommodation-Modification Summary Sheet</u>

Class:_____	Preferential Seating	Extra time to complete assignments	Exemption from reading in front of peers	Short instructions	Written instructions	Study sheets	Copy of class notes	Do not count semester exam if score causes failure	In class teacher support (minutes/week)	Behavior Intervention Plan (BIP)	Modified tests (3 choices)	Modified curriculum	Reduced assignments	Small group testing	Oral tests- Small grp testing
Student Name:	A	A	A	A	A	A	A	M	M	M	M	M	M	M	M

Accomodation (A)- Best practices used for all students but does not alter what is being taught.

Modification (M)- Lowers the intellectual level of the content delivered; a change in what is being taught or expected.