

Strategies to Maximize Special Education STAAR
Achievement

By

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Abstract:

This document is from presentations at the 2015 annual conference of the Science Teachers Association of Texas (STAT). The two presentations (each listed as featured sessions at the state conference) examined strategies used in a three-tiered program designed to maximize Texas end-of-course chemistry achievement for special population students: inclusion (IN) special education students, economically disadvantaged (EDS) students, limited English proficiency (LEP) students, and 504 students. The three-tiered program was based on school culture findings, productive classroom management, and testing strategies. The presenter developed the program over five years studying over 500 students consisting of 80% high school sophomores and 20% high school juniors. The overall passing rate for the combined pilot and state chemistry testing was in the 90% passing range. For the last and only year of Texas end-of-course STAAR state chemistry testing (because of changes in the state law of Texas), the presenter had more commended students on the chemistry STAAR state test than any other chemistry teacher at the 6A Robert E. Lee High School in Tyler, Texas. This was in comparison to teachers with largely pre-AP, AP, and IB students. The presenter's students were from the on-level, special education, economically disadvantaged, limited English proficiency, and 504 populations. These results indicate that the presenter's students made significant academic progress using the three-tiered program components noted in the conference presentations. This document will share specific strategies the presenter has used to maximize special population student achievement and state end-of-course test scores.

Strategies to Maximize Special Education STAAR Achievement

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2015 Annual Conference of the Science Teachers Association of Texas (STAT)

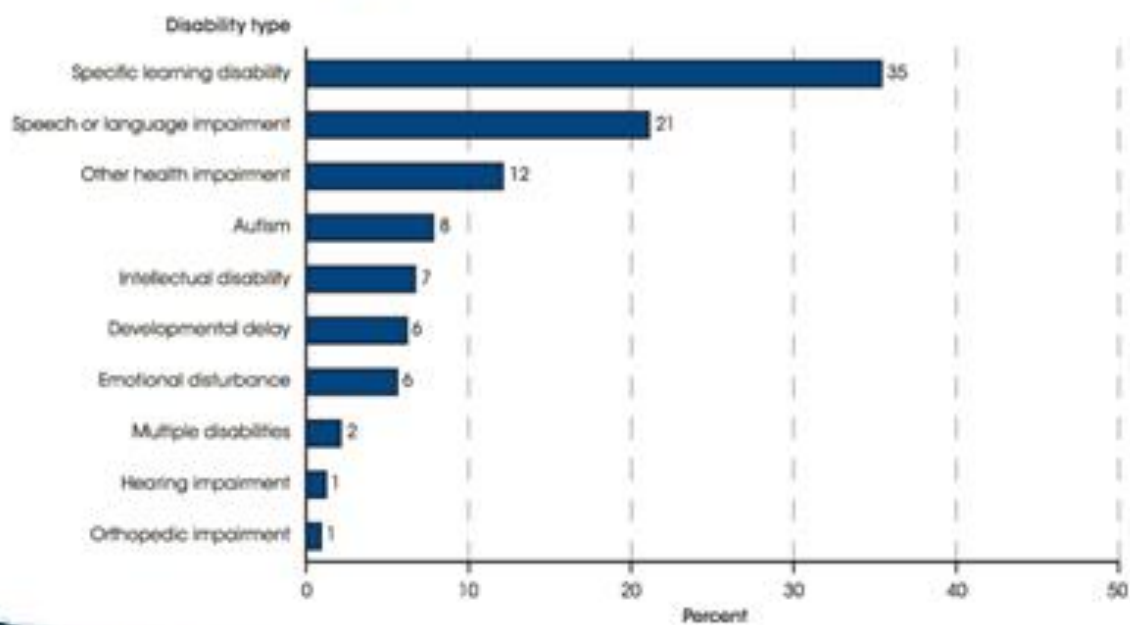
Fort Worth, Texas
November 12-14, 2015

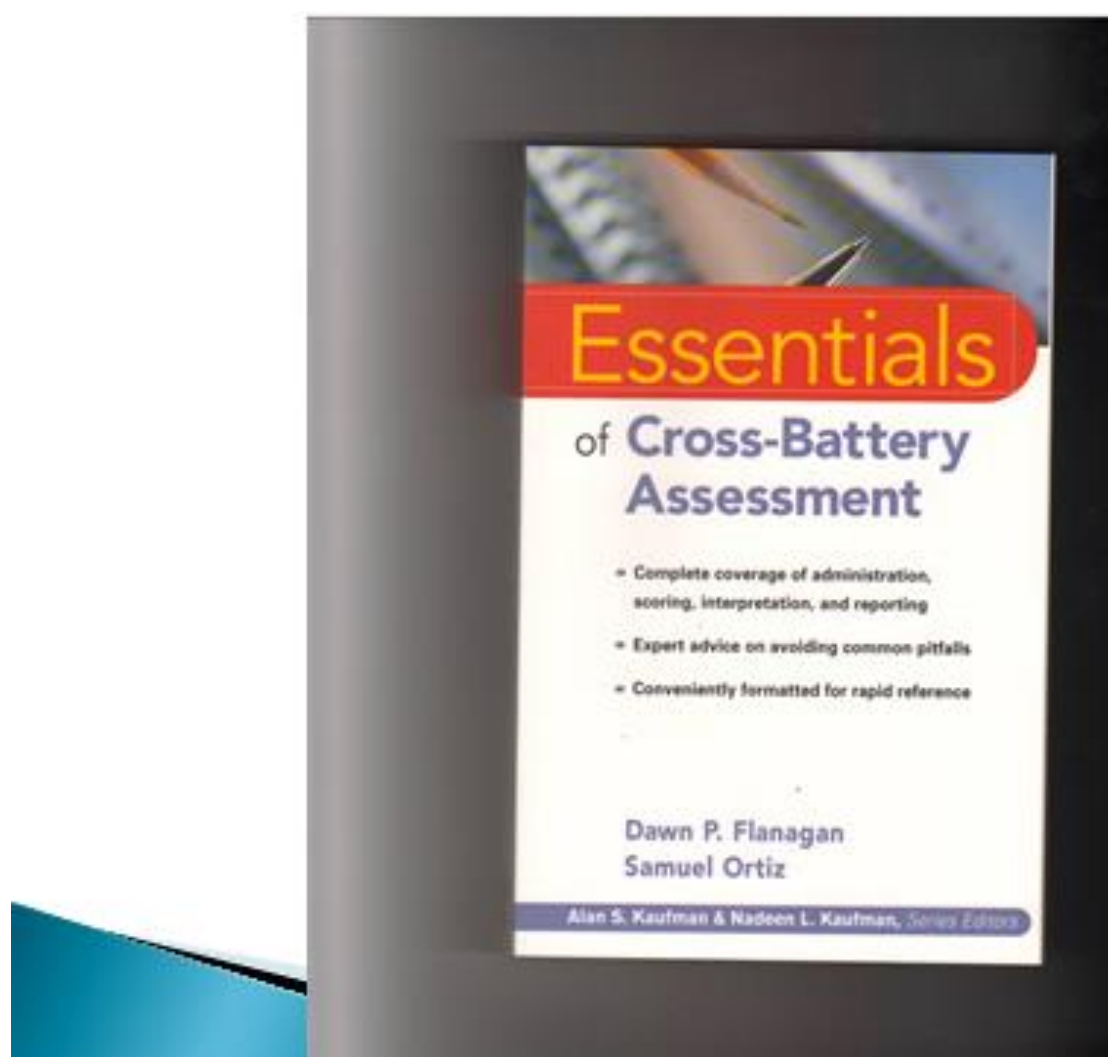
Ballroom B 11/12/15 (Th) 2:30-3:30
Ballroom B 11/14/15 (Sat) 8:30-9:30



Children and Youth with Disabilities

- Percentage distribution of children ages 3-21 served under the Individuals with Disabilities Education Act (IDEA), Part B, by disability type: School year 2012-13







Classroom
MANAGEMENT
that Works

Research-Based Strategies for Every Teacher

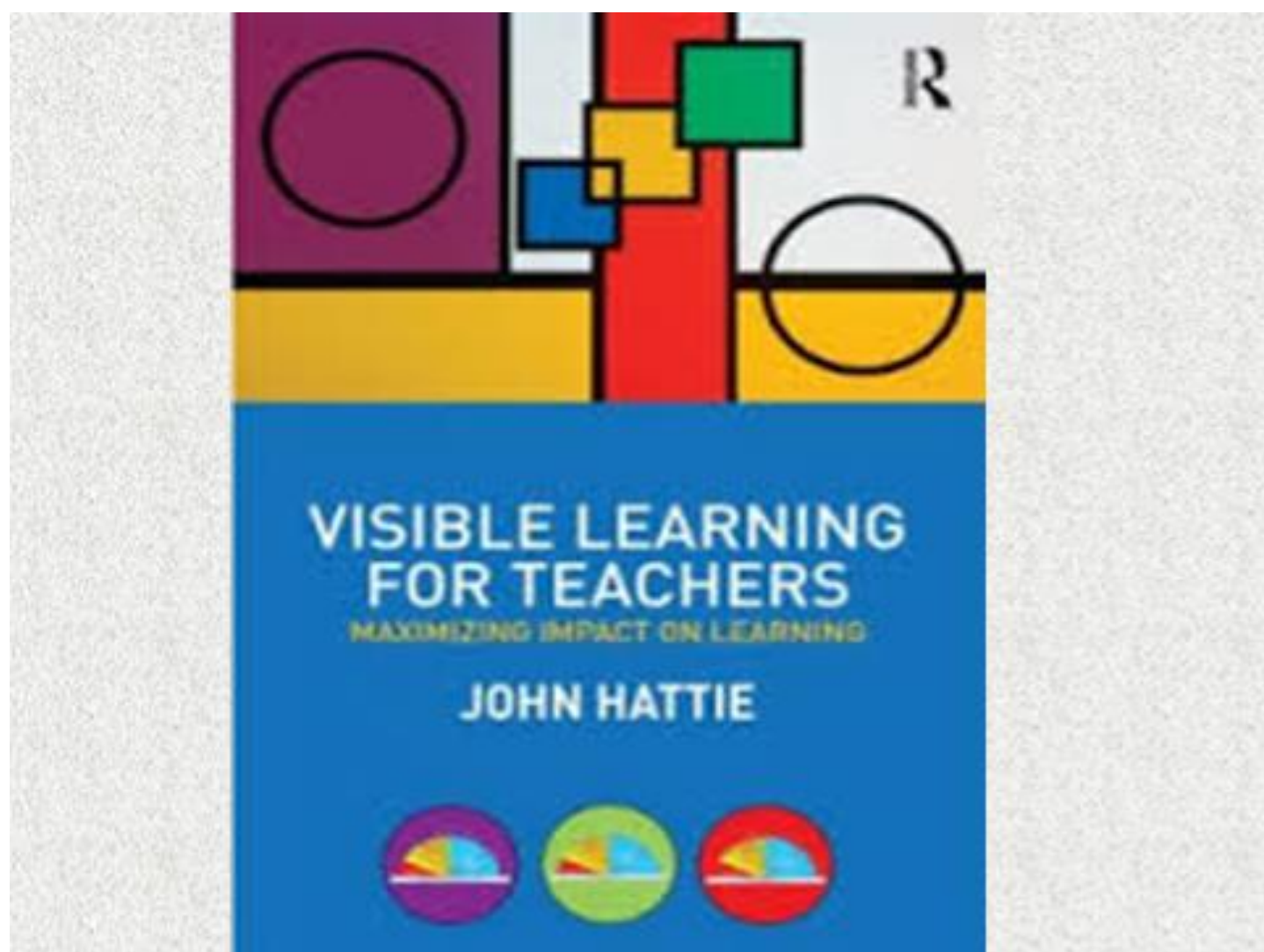
Robert J. Marzano

with Jane K. Marzano & Debra L. Pickering

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(2012)

➤ *How to apply principles from his 2009 book*

- 100+ meta-analyses added
- 5,000,000 students added
- 13,428 effect sizes added

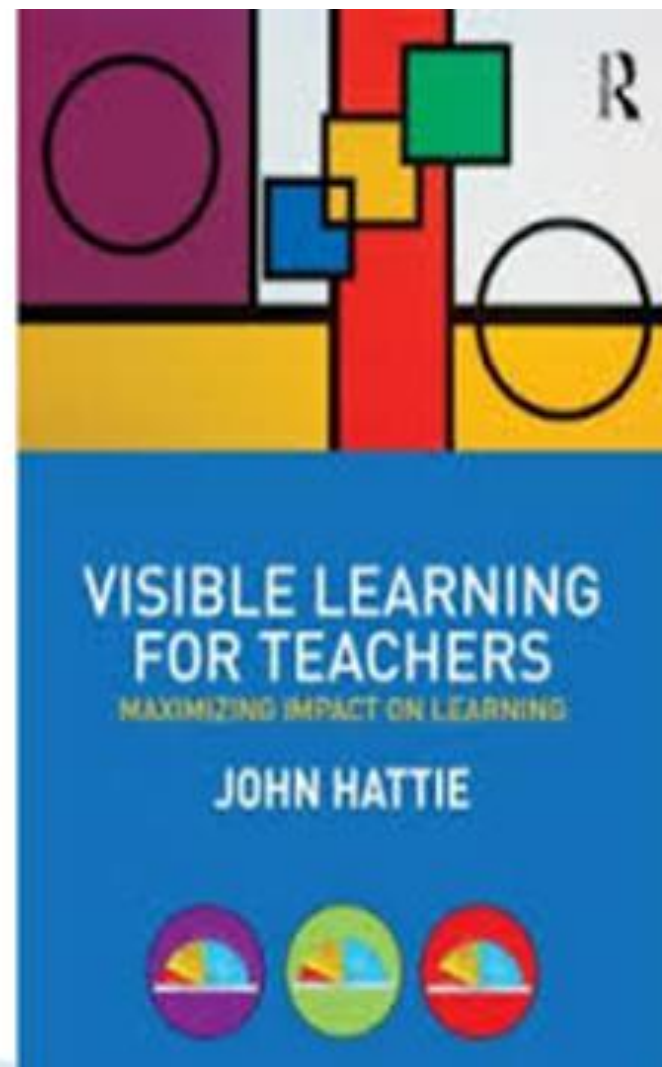
How to Maximize Student Achievement



Found (1992) that special education students could achieve as much as “normal students”, 4277 research studies and 8545 effect sizes.

WHY?

Teaching strategies that work for “normal students” work for special education students.

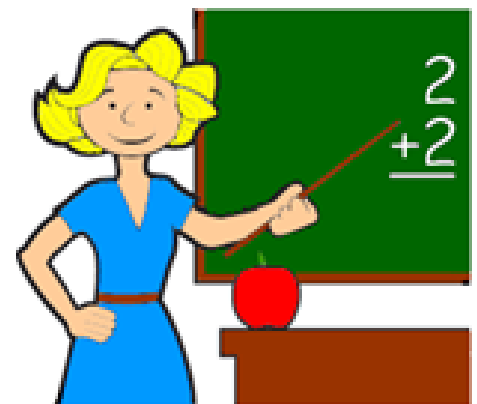


John Hattie's 2012 Book 150 Influences on Achievement

Influence	Effect Size
Self-reported grades/student expectations	1.44
Piagetian programs	1.28
Response to Intervention (RtI)	1.07
Teacher credibility	0.90
Providing formative evaluation	0.90
Micro-teaching	0.88
Classroom discussion	0.82
Comprehensive interventions for learning disabled students	0.77
Teacher clarity	0.75
Feedback	0.75
Teacher-student relationships	0.72
Questioning	0.48

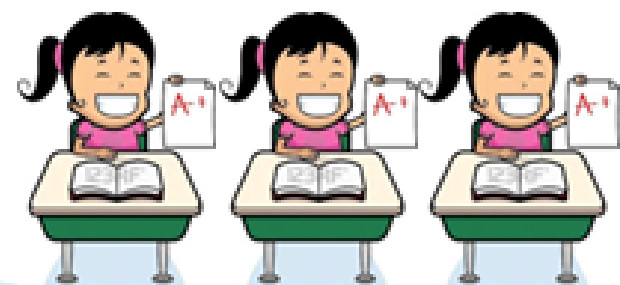
Information– Strategies used for all Special Population Students

- ▶ Poorly performing schools: places where little learning going on, so look at research (John Hattie, Robert Marzano) on learning and pedagogy strategies.



Information– Strategies used for all Special Population Students

- ▶ Best predictors of student dropouts: attendance in 9th grade, academic achievement (grades) in 10th grade, and reading level below the 20th percentile. Also see E0919 AT-RISK-INDICATOR-CODE, Texas.
- ▶ Helping at-risk students: empowering school workgroups like PLCs and school academics.



Information– Strategies used for all Special Population Students

- ▶ Non-Cognitive Skills:
 - Organization (notebook)
 - Self-Control (seating helps)
 - Resiliency (set up class where all students can pass if they work) Ex. Grading, 60% tests and 40% daily work.



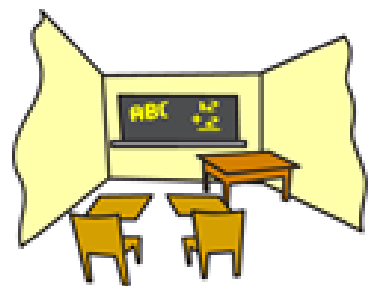
Information– Strategies used for all Special Population Students

- ▶ Foundations of Academic Achievement Built Through Relationships
 - Getting along with others
 - Stress management
 - Communication
 - Persevering
 - Dealing with setbacks
 - Problem solving



Information– Strategies used for all Special Population Students

- ▶ At its most fundamental level, school is social (about relationships). Ex. helping a new student at your school.
- ▶ Build classroom culture. Students know teacher has their best interest at heart, so they will work. Fewer distractions and discipline problems. Called “things of the heart” to connect with students emotionally, not only academically.



Homeroom Student Meetings to Address Social and Emotional Issues Facing Students

- ▶ Dropout rates
- ▶ Lack of Student Motivation
- ▶ Absenteeism
- ▶ Graduation Rates
 - These are manifestations of social-emotional problems in self-regulation, stress management, and empathy.



Strategies (cont.)

- ▶ Save our students program (SOS) for students who failed TAKS/STAAR. All work done in class, no homework, many class activities related to the state test. This encouraged attendance, and 90% passed the state science tests.
- ▶ Train all the school staff in neuroscience topics like social-emotional development, culture, and building relationships.



Soft Skills

- ▶ Getting along with others
- ▶ Dealing with setbacks
- ▶ Problem solving
- ▶ Planning
- ▶ Perseverance
- ▶ Organization
- ▶ Communication
- ▶ Have a class notebook



Process Skills

- ▶ Process skills in science, (et al)
- ▶ Formulas
- ▶ Draw inferences
- ▶ Communicate scientific conclusions
- ▶ Collect and organize data
- ▶ Plan and implement experiments
- ▶ Evaluate changes based on data
- ▶ Plan, implement & ask questions
- ▶ Analyze, evaluate & critique data



Why Students Fail

- Poor choices
- Bad habits
- Faulty judgment
- Wishful thinking only
- Lack of ambition
- Bad “friends”



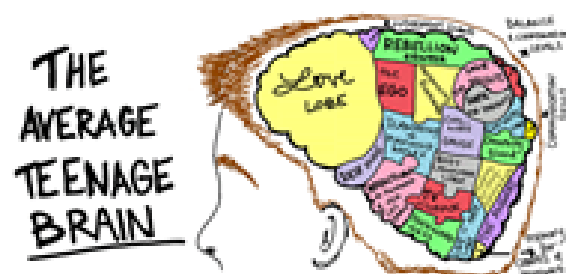
Why Students Fail(cont.)

- Lazy-not work
- Easily frustrated
- Not plan for the future
- Live only for the present
- Not organized-not have a notebook



Accommodation–Modification Definitions

- ▶ Accommodation– Best practices used but does alter what is taught.
- ▶ Modification– Lowers the intellectual level of the content delivered (a change in what is being taught or expected).
- ▶ How To Tell If A Special Education Student is Performing Successfully
(Plus or Minus ONE S.D. from Class Mean)



Special Education Accommodations

- ▶ Preferential Seating
- ▶ Extra Time to Complete Assignments
- ▶ Extra Time to Complete Tests
- ▶ Assignment Notebook
- ▶ Exemption from Reading in Front of Peers
- ▶ Short Instructions
- ▶ Written Instructions
- ▶ Study Sheets
- ▶ Copy of Class Notes



Special Education Modifications

- ▶ Do not Count Semester Exam if Score Causes Semester Failure
- ▶ In-Class Teacher Support (IEP Gives Minutes Per Week)
- ▶ Behavior Modification Plan (BIP)
- ▶ Modified Tests (3 Choices)



Special Education Modifications

Learning strategies

- ▶ Modified Curriculum
- ▶ Reduced Assignments
- ▶ Small Group Testing
- ▶ Oral Tests in Small Group Testing
- ▶ Oral Responses on Testing



Continuing Topics

- **Decoding the School/Classroom**
- **Decoding the Student**
- **Decoding the STAAR Test**



How to Build a Classroom Culture

- Class is set up so all students can succeed [ES=.521] (+ 20%)
- Students are engaged [ES=.617] (+23%)
- Greet students at the door between classes



How to Build a Classroom Culture(cont.)

- Seat alphabetically to learn names
- Call roll orally so students learn each others' names
- Identify class leaders: win them over



How to Build a Classroom Culture(cont.)

- Stay in touch with the parents
- Put daily academic agenda on the board
- Great teaching comes from:
 - Passion of the teacher
 - Engagement of the student



The Great Teachers

[Have to Teach Ten Years or 10,000 Hours]

- 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



Identifying What Matters

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

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



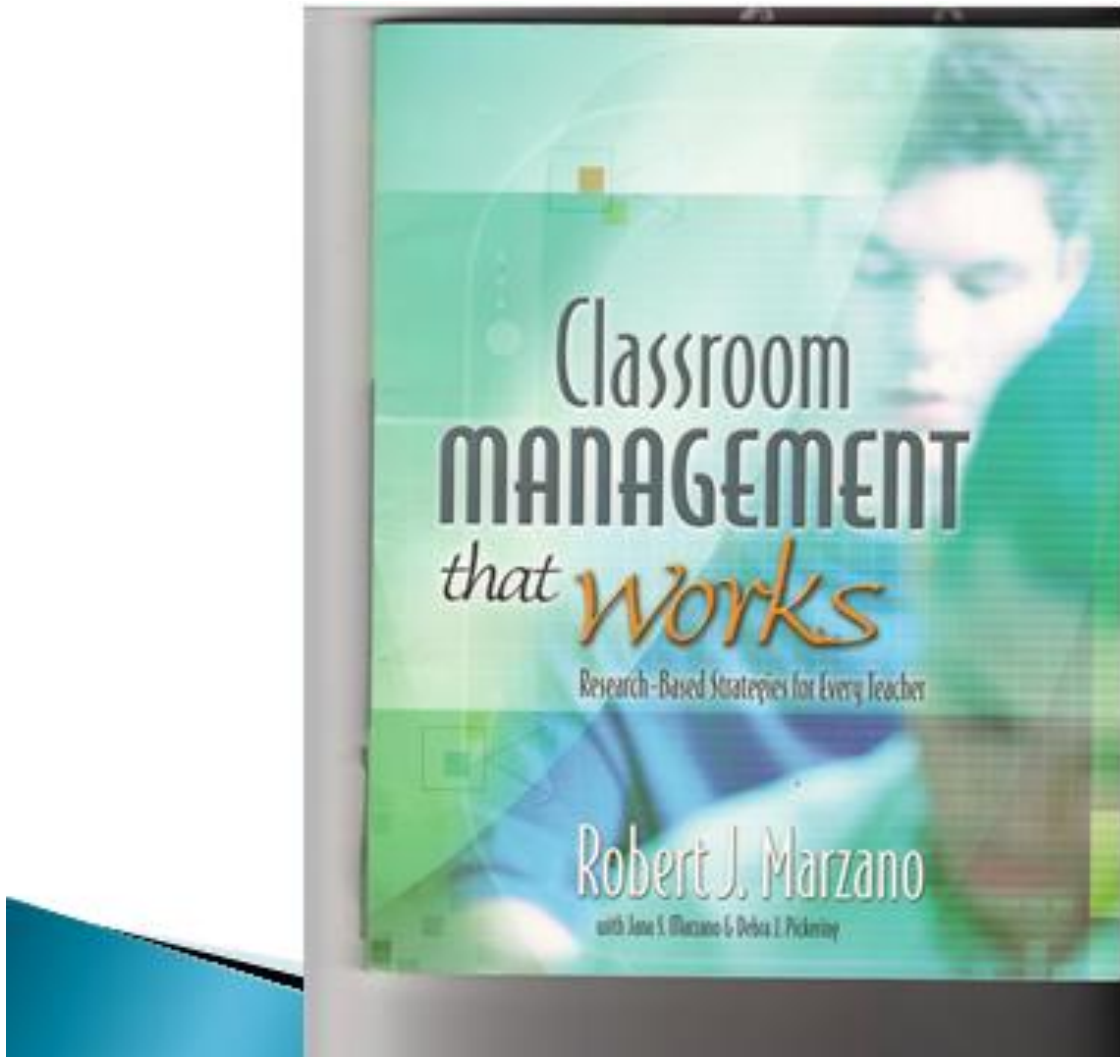


Figure 1.3. Meta-analysis Results for Four Management Factors

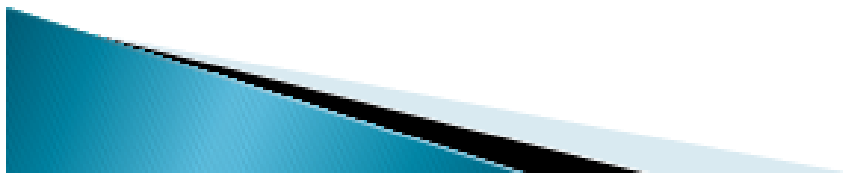
Factor	Average Effect Size	Number of Subjects	Number of Studies	Percentile Decrease in Disruptions
Rules and Procedures	-.763	626	10	28
Disciplinary Interventions	-.909	3,322	68	32
Teacher-Student Relationships	-.869	1,110	4	31
Mental Set	-1.294	502	5	40

Note: All effect sizes are significant at the .05 level.

Robert Marzano Classroom Management that Works (2003, p. 8)

Classroom Rules

- Rules should be reasonable
- Rules should be objective
- Use as few rules as possible
- Be consistent with consequences for breaking rules



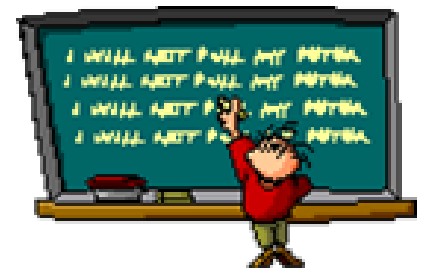
Classroom Rules(cont.)

- Clear rule setting is helpful for all students. Expectations should be explicit, fair, and within the student's range of achievement.
- Problems occur when there is a discrepancy between what the teacher expects and what students do.



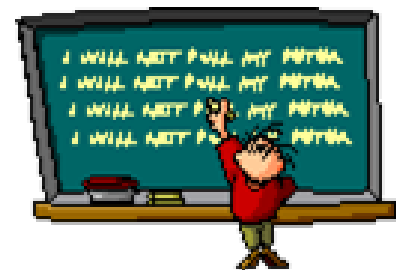
Ten Components to a Preventative Discipline Program

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



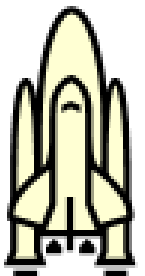
Ten Components to a Preventative Discipline Program(cont.)

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



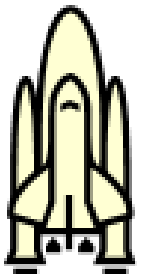
Engagement Examples

- If all the computers in the world were connected, that would be equivalent to one human mind.
- If all the empty space in the body was taken out, each person would be the size of a pea.
- One milliliter of free electrons at the base of the launch vehicle would stop the former space shuttle from “taking off”.




Engagement Examples(cont.)

- One thimble of free electrons would be powerful enough to keep the moon in orbit around the earth.
- One human cell is more complex than New York City.
- You have 99.5% of your parents' DNA and share the following DNA: 98% with chimpanzees, 90% with dinosaurs, and 40–50% with cabbage.

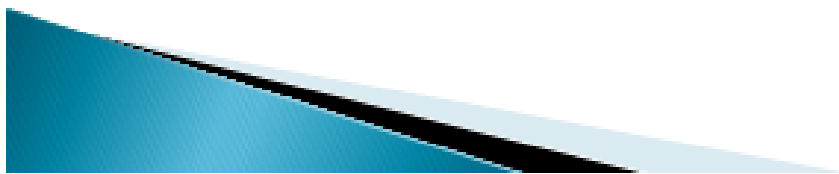


Students with Emotional Problems

- 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.)

- A general pervasive mood of unhappiness or depression.
- 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




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

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)



Summary of Presentations

As the power point slides showed, the two presentations focused on strategies to maximize special education STAAR achievement. Although these strategies focused on maximizing state test scores, the content was generic in nature and was applicable to improving achievement in both middle school and high school special education classrooms. The three-tiered program was based on school culture findings, productive classroom management, and testing strategies.

Furthermore, the success of these program components has been based on the school production research literature. The research of John Hattie has been especially significant (Hattie, 1992, 2003, 2009, & 2012) in the formulation of the program. Information about Dr. Hattie's research follows with special note of his research in special education. A review of the power point presentation will follow the information about Hattie's research.

What Works for Special Education Students

John Hattie's most recent book, *Visible Learning for Teachers: Maximizing Impact on Learning* (2012) was 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 was the largest study of education in the history of the world, and he identified what actually works in schools to improve learning for all students. On the basis of his research in special education settings, Hattie (1992) found that special education students could achieve as much as "normal" students if they had special education trained teachers. This was a key to the special

education students' achievement. 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 external policies) that made the difference in student achievement.

In 2003, Hattie listed the similar factors that worked 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 referred to the teacher's effects on instructional quality. According to Hattie's research, what students brought to the classroom accounted for 50% of the variance of achievement, but even so 30% of the variance was accounted for by the teacher.

One Hundred and Fifth 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 top 150 influences refer to special education students or special education programs. For example, the number two influence on student achievement was “Piagetian programs” (effect size 1.28). However, these programs have not been used extensively in the United States. “Response to intervention” (effect size 1.07) was number three on his list, and Hattie’s “Comprehensive interventions for learning disabled students” (effect size 0.77) was his number eight influence. Both are top strategies used in special education instruction. According to Hattie (2012), feedback was 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” were numbers 44 and 45 on the rank-ordered listing of the 150 influences. In other words, dozens of influences had greater effect sizes than students’ backgrounds. What does this say about the ideas that special education students cannot learn? Our work with special education over the past decade has shown that special education students are very capable of learning and achieving with a teacher trained in special education.

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 (compared to the effect size of the teacher). Yet these influences still seem to dominate our debates. We like to talk about things that really don’t have very large effect sizes, such as all the structural things and the way schools are organized. The most powerful effects, however,

are related to features in 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 students alphabetically so they can learn their students' names. These teachers also identify their class leaders so that group can be a positive influence on the other students. The great teachers can identify the most important ways to represent the subject material they teach. That's why they are great teachers. Also, they are 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.

Power Point Slides

The power point slides first showed the percentage distribution of children ages 3-21 served under the Individuals with Disabilities Education Act (IDEA), Part B, by disability type. These types were discussed along with the characteristics of children in several of the groups. Next, the 2001 Essentials of Cross Battery Assessment by Dawn Flanagan and Samuel Ortiz (Alan S. Kaufman & Nadeen L. Kaufman, Series Editors) was discussed to clarify how the theory of cognition related to special education testing and placement. This was followed by a review of Hattie's research findings about special education students. Next, the effect size of several strategies from Hattie's 150 influences on achievement were reviewed (Hattie, 2012). Then information about teaching strategies used with special population students was reviewed

along with the placement of special population students. This discussion encompassed several slides focusing on soft skills needed by special population students to achieve in school as well as process skills and their importance.

This was followed by a discussion of why students fail, then a discussion of special education accommodations and modifications. The continuing topics dealt with decoding the school and classroom, decoding the student, and decoding the state tests. There was then a discussion of how to build a classroom culture so all special population students could succeed. This included why the great teachers are great teachers. Next, there was a discussion of Robert Marzano's meta-analysis from his Classroom Management that Works book. His four management factors along with the average effect sizes of each and the percentile decrease in classroom disruptions was noted. This led to a discussion about classroom rules and the ten components of a preventive discipline program. A positive climate has to be built for special population students to work and achieve. This was followed by student engagement examples and characteristics of students with emotional problems. Next there was a discussion of test taking strategies and a brief explanation of how item response theory (IRT) has been used in the development of state and national tests. The intent was to show what students need to know about tests and testing. This is an overlooked area in state test preparation. Last, the presenter took questions from the audience at the conclusion of the sessions. Also, both of the presentations were noted as featured sessions in the CAST conference program.

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Bios:

Dr. William Johnson, a patentee in chemistry, teaches chemistry at Robert E. Lee High School in Tyler, Texas. Having served as a consultant in industry/education and published over 250 articles, he has presented at more than 50 conferences. While earning his doctorate from Texas Tech University, he was a Jones Fellow. Annabel M. Johnson, Ph.D., is a former university professor and administrator. She has a Ph.D. from Texas Tech University where she served as Acting Graduate Dean of the College of Family Studies while she earned her Ph.D. degree. The Drs. Johnson have consulted in special education on-site with international governments. Jared W. Johnson, B.S. in Business, is a graduate of Stephen F. Austin University. He is an expert in the areas of computer design and graphics.