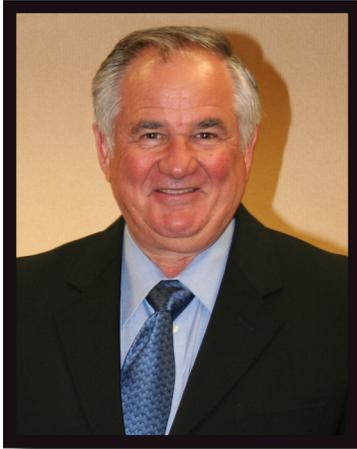


# Excellence & Equity

## Proven Methods Meet the Challenges

### Dr. Spencer Kagan



The United States, like most countries in the world, faces two challenges with regard to academic achievement: 1) fostering among all students a high level of knowledge and skills necessary for success in the 21<sup>st</sup> Century, and 2) reducing the discrepancy in educational outcomes between low-income versus high-income students and minority versus majority students. The first crisis is a crisis in excellence; the second crisis is a crisis in equity. These two challenges have reached crisis proportions because of the growing demands of a 21<sup>st</sup> Century education and the increasing numbers of minority and low-income students failing to receive an adequate education. Inability to address the first challenge will result in our failure to prosper; inability to successfully meet the second challenge will increasingly polarize our society and ultimately lead to a failure in democracy. Not only do an increasing proportion of students leave school without the knowledge and skills necessary to compete well in the global economy, each school year, minority and low-income students fall farther behind majority and high-income students. Lack of educational equity violates a basic tenant of a true democracy. The health of a democracy depends on its ability to fully develop the potential of all students. We need wise decisions made not by some voters, but by all voters. Failure to meet these two challenges — creating schools of excellence and schools of equity — undermines our ability to realize our core values, our ability to prosper economically, and our ability to meet the needs of our present students as well as their children.

A more complete documentation and examination of the challenges in excellence and equity is provided in the book, *Kagan Cooperative Learning*.<sup>1</sup> In a nutshell:

### The Excellence & Equity Challenges

#### ► Challenge 1: Excellence

The United States educational system has “been committing an act of unthinking unilateral educational disarmament.”<sup>2</sup> Compared to our international peers, our students score near the bottom in math and problem solving, and have performed at a mediocre level in reading and science.<sup>3</sup>

#### ► Challenge 2: Equity

Black, Hispanic, and Native American students score substantially below Euro-American and Asian-American students in all academic content areas and at all grades.<sup>4</sup> This lack of equity, commonly known as the Achievement Gap, contributes to but does not fully account for the crisis in excellence.

**“Of all classroom grouping strategies, cooperative learning may be the most flexible and powerful.”**  
—Ellis & Fouts

We have within our grasp, however, the ability to meet both challenges: Scientific educational research reveals we have at hand proven methods to dramatically increase both educational excellence and educational equity. We do not lack the tools; we need only provide those tools to all teachers and fully support their use. The researchers have done their part; it is now up to us as educators to implement what we know promotes both excellence and equity.

### **The Cooperative Learning Antidote**

Based on an enormous body of research, we can say with great confidence, cooperative learning is a powerful antidote to lagging achievement and the achievement gap. Cooperative learning is not new. Decades of research, over 1,000 studies, have tested the effectiveness of cooperative learning methods. The research consistently finds cooperative learning dramatically improves student achievement in all subject areas, at all grades, and, most importantly, for all groups of students. In an extensive review of empirical research on educational innovations, Ellis and Fouts concluded: “Of all the educational innovations we have reviewed for this book, cooperative learning has the best, largest empirical base.”<sup>5</sup> In a more recent review summarizing research-based strategies for increasing student achievement, noted educational research team, Marzano et al. found: “Of all classroom grouping strategies, cooperative learning may be the most flexible and powerful.”<sup>6</sup>

### **Cooperative Learning Meta-Analyses**

In their examination of educational practices that work, Marzano and his co-workers relied on meta-analyses as opposed to presenting the results of individual research studies. Meta-analysis uses average effect size to show the pattern of results across studies. Because meta-analyses are based on a large number of research studies, results are far more reliable than conclusions based on single studies. Figure 1 illustrates the results of the five meta-analyses presented by Marzano and associates.

**“Of all the educational innovations we have reviewed for this book, cooperative learning has the best, largest empirical base.”**  
—Marzano, Pickering, & Pollock

**Figure 1. Meta-Analyses: Cooperative v. Traditional Instruction**

Focus	No. of Effect Sizes (ESs)	Ave. ES	Percentile Gain
Cooperative Learning v. Traditional <sup>1</sup>	182	.78	28
Cooperative Learning v. Traditional <sup>2</sup>	414	.63	23
Cooperative Learning v. Traditional <sup>3</sup>	122	.73	27
Cooperative Learning v. Traditional <sup>4</sup>	104	.78	28
CL v. Individual Competition <sup>5</sup>	70	.78	28

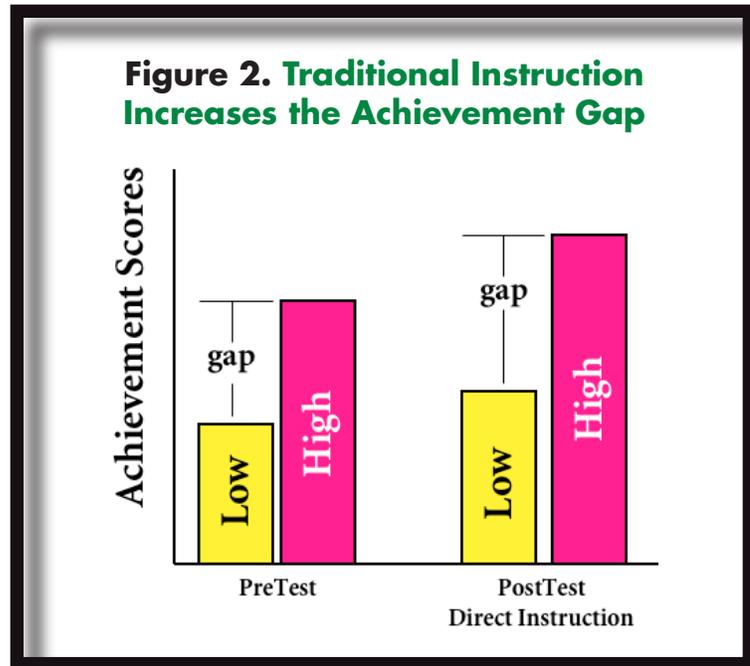
Source: Marzano, R.J., Pickering, D.J., Pollock, J.E. *Classroom Instruction that Works*. Research-Based Strategies for Increasing Student Achievement. Alexandria, VA; ASCD, 2001. 1 Walberg, 1999; 2 Lipsey & Wilson, 1993; 3 Johnson, Maruyama, Johnson, Nelson, & Skon, 1981; 4 Johnson & Johnson; 5 Johnson & Johnson.

What is notable across these meta-analyses is both the size and consistency of outcomes. Cooperative learning consistently outperforms traditional instructional strategies with an average overall effect size of .74 which equates to an overall percentile gain of 26.8. In concrete terms, that means if we had placed students from a traditional classroom in a cooperative learning classroom, instead of scoring an average of 50%, the same students in the same time period would have scored an average of 76.8%! Some students would do even better and some worse, but the average gain would be 26.8%!

Although the results of these meta-analyses indicate cooperative learning is a powerful tool to address the crisis in excellence, they do not inform us about how well cooperative learning produces equity. For example, if high and low achieving groups of students both increase their achievement in equal amounts, the size of the achievement gap would remain constant. To determine if cooperative learning is a solution to the equity problem, we have to look at different data — we have to ask, How much do different groups gain? Do low achieving groups catch up? Does cooperative learning reduce the achievement gap?

## Cooperative Learning Reduces the Gap

For illustrative purposes, let's look first at graphs that illustrate the pattern of achievement across studies for different groups. After that, we will turn to actual achievement data. Examine Figure 2. The first pair of bars in the graph contrasts the pretest scores of two groups of students: low achievers and high achievers. In any classroom, school, district, or country, if we test students at any point, some are higher and some are lower. Now look at the second pair of bars. If we teach those students with traditional instructional strategies (call on one student at a time to respond to teacher questions, tell students to work alone on their worksheets) and test the students later, say after six weeks, a school term, or a whole school year, everyone gains. The high achievers are higher than they were, and the low achievers are higher than they were. But notice what the second pair of bars in the graph illustrates: If we use traditional instructional strategies, the gap between the high and low achievers increases!

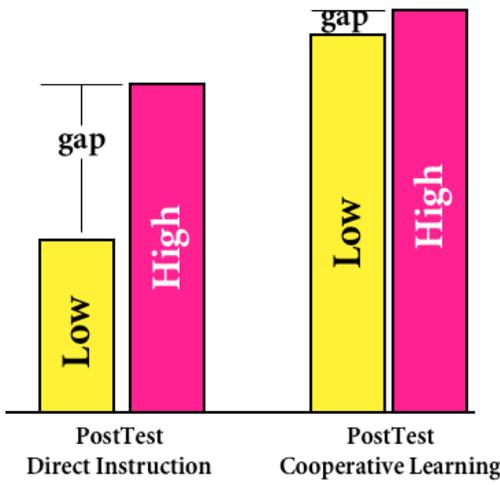


The high achieving students are learning at a higher rate. Each school year the high achievers pull farther ahead of their lower achieving counterparts. We have a progressive school achievement gap. The longer our students are in school, the greater the gap between our high achievers and our low achievers; between our low-income and high-income students; between our majority and minority students. In fact, by high school the size of the actual gap is impossible to measure because minority and low achieving students drop out of school at alarming rates.

That the high achievers learn more in traditional instruction is not a mystery. We will examine the causes of the progressive school achievement gap toward the end of this paper. For now, let's examine what happens if instead of traditional instructional practices, for the same amount of time we use

**Each school year the high achievers pull farther ahead of their lower achieving counterparts. We have a progressive school achievement gap. The longer our students are in school, the greater the gap.**

**Figure 3. Cooperative Learning Reduces the Achievement Gap**



cooperative learning. In Figure 3, next to the results from classrooms using traditional instructional strategies, find two additional bars in the graph. These bars illustrate what happens when cooperative instructional strategies are used. The meta-analyses indicate there is approximately a 26% gain for students in the cooperative learning classroom over the traditional classroom. But where is the gain coming from? Our high achievers are going up. But the most dramatic gains, by far, are from the low achievers. When cooperative learning is used, there is a dramatic acceleration in achievement among the lower achieving students — an effect that drastically reduces the achievement gap! In cooperative

learning classrooms, students who were not “playing the game,” who were allowing the high achievers to do all the work, turn on. As we would expect, we see the largest gains for unmotivated students who become motivated. Students who were hiding in the traditional classroom begin participating, and their achievement skyrockets. This pattern of data — dramatic increases among lowest achieving students — is consistently found in studies that compare the achievement levels of majority and minority students in cooperative and traditional classrooms.

### Consistency Across Studies: Cooperative Learning Increases Equity

One of the most remarkable results in the study of educational equity is that cooperative learning consistently reduces the achievement gap among different populations, regardless of grade level and academic content, and even across different cooperative learning methods. Let’s examine five studies:

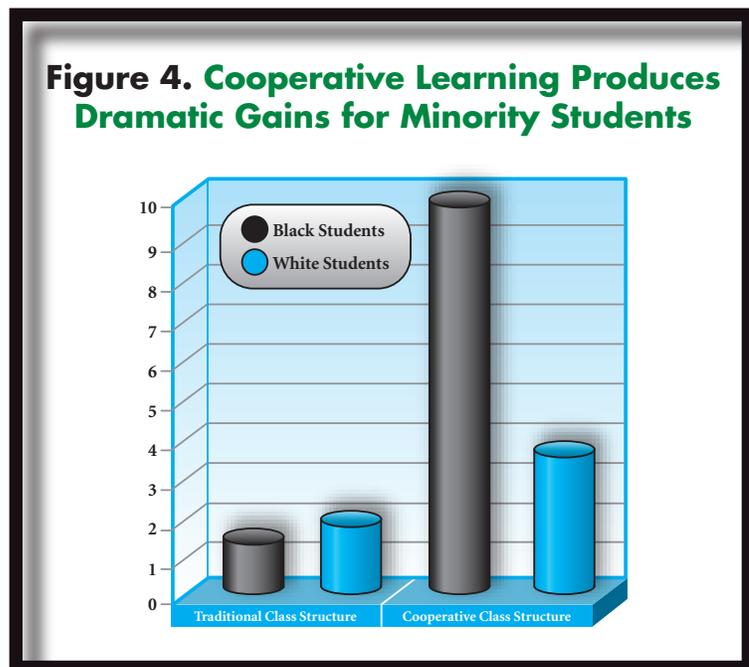
**Study 1: STAD.** Student Teams Achievement Divisions (STAD) is a cooperative learning method that has students practice in teams to master academic content. They earn points for their team by improving their achievement compared to their usual level of achievement. In a controlled research study that compared STAD to the traditional instruction, there was an overall increase in achievement for both Black and Anglo American students (increased excellence), but “the treatment effect on achievement was largely due to a Race X Treatment interaction. Black students did much better in STAD than in control” (p. 57).<sup>7</sup> All students did better when cooperative learning was used, but the lower achieving minority students did dramatically better, closing the achievement gap!

**Study 2. Jigsaw.** An entirely different cooperative learning method, Jigsaw, demonstrated the power of cooperative learning to address the equity challenge. The study was conducted among students of a different grade level and a different academic content, but the results indicated a similar increase in equity. In Jigsaw, each student on the team masters a different part of the lesson. Each teammate

leaves the team, and works with like-topic members from other teams. Students then return to teach their teammates their portion of the content. The results of the study:

Specifically, the data show that in integrated schools Anglos learned equally well in both Jigsaw and competitive classes, but Blacks and Mexican Americans learned much more in Jigsaw than in competitive classes (p. 117).<sup>8</sup>

**Study 3. Student Team Learning.** Using a different cooperative learning method, with a different student population, at a different grade level, in a different part of the country, and with a different curriculum content, the same result obtained: increased equity. Researchers examined gains in English grammar using standardized tests among Black and White inner city junior high school students.<sup>9</sup> The study compared results when students attempted to master basic grammar using either cooperative learning or traditional instructional strategies. The gain scores are plotted in Figure 4. There are two things to note: First, compared to traditional instruction, cooperative learning produced far larger gains for all students (increased excellence). Second, Black students “turned on” with cooperative learning, reducing the school achievement gap (increased equity). Black students in traditional classrooms showed very little gains, but when cooperative learning was used, they gained dramatically — more than twice as much as any other group. It is the power of cooperative learning to engage and motivate lower achieving students that increases the equity of educational outcomes.



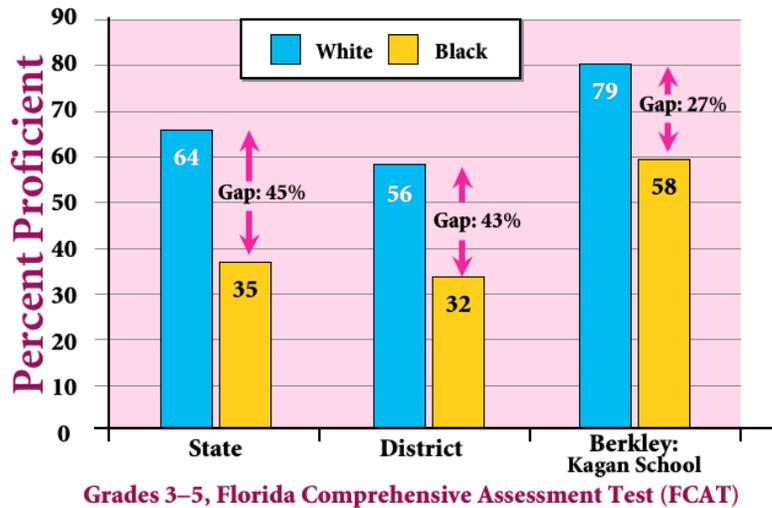
#### **Study 4: The Riverside Cooperative Learning Study.**

In order to test the overall impact of cooperative learning (excellence) and to test whether minority students in particular performed especially better when cooperative learning instructional strategies were used (equity), thirty-five student teachers were randomly assigned to teach using one of three approaches to instruction: traditional, cooperative, and a mixed condition that included cooperative teams but intense between-team competition.<sup>10</sup> Approximately 900 students were tested. Results supported the conclusion that cooperative learning produced superior outcomes for all students, but especially for Black students, who were the most cooperative in their social orientation. A variety of other outcomes of the Riverside Study support the general conclusion that minority students fare far better in cooperative learning classrooms. Attitudes toward schoolwork and social climate were more favorable in the cooperative learning classrooms for all students, but especially for Black and Hispanic students.

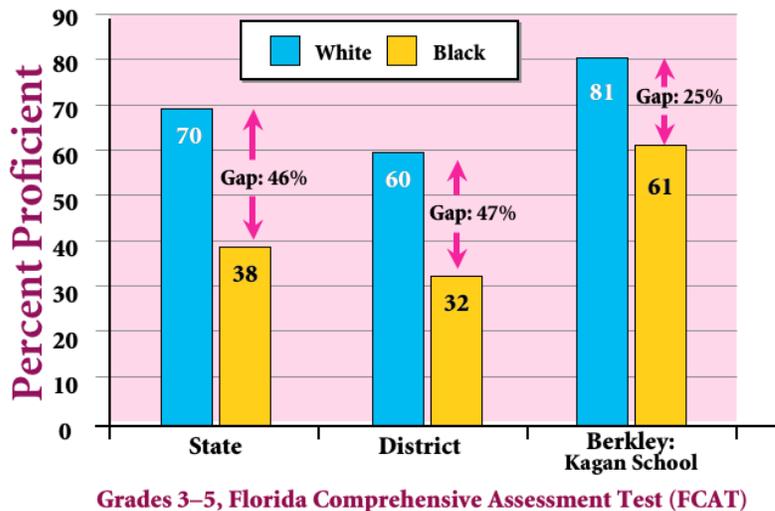
### Study 5: A Cooperative Learning School.

In the final study presented here, we examine the impact on excellence and equity when an entire school adopts cooperative learning methods as their primary approach to instruction throughout the curriculum.<sup>11</sup> A new school was to be opened in one of the largest school districts in Florida. Before opening the school, the decision was made to make Kagan Cooperative Learning Structures the major focus for instruction. Because the school was to draw from students in surrounding schools in the district and was to use the same district curriculum materials, district achievement scores provide a good comparison against which to measure the gains made when Kagan Cooperative Learning structures are adopted. The question: Would adoption of the cooperative learning structures in the new school boost excellence and equity compared to surrounding schools that did not use the cooperative learning methods?

### Figure 5. Cooperative Learning Increases Excellence and Equity in Reading



### Figure 6. Cooperative Learning Increases Excellence and Equity in Mathematics



Let's look first at the equity issue throughout the state of Florida. A glance at the first two bars in both Figure 5 and Figure 6 reveals a tragedy that is occurring across the United States: Black students are reaching reading and math proficiency at about half the rate of White students. There is a 45% achievement gap! Now, look at the next pair of bars in each graph. These show the reading and math achievement of students in Polk County, the district within Florida that opened the Kagan School. The Black and White students within the district have lower rates of proficiency than their state peers, predictable because of the lower income level in Polk County compared to state norms. Although the overall achievement levels in the district are somewhat lower than state norms, the overall pattern

for the district is the same as for the state: The achievement gap is approximately the same (43%) between the Black and White students. This is the pattern we would expect if the new school to be opened, Berkeley Elementary School, were to use the same traditional instructional strategies as did surrounding schools in the district.



The school, however, made a commitment to open as a Kagan Cooperative Learning school. Kagan Professional Development partnered with the school to conduct teacher workshops, coach teachers in the use of cooperative learning structures, and to support administration in various ways to promote the use of cooperative learning structures by all teachers. Kagan Structures were used in faculty meetings and woven into the culture of the school. By the end of the school year, all teachers were using the cooperative structures on a very regular basis. The result: The last pair of bars in Figures 5 and 6 tell the story. Increased excellence is shown by the higher level of overall achievement of White and Black students compared to state and district norms. Increased equity is shown by the dramatic gains of Black students. Black students in the cooperative learning school actually outperformed the White students in the district!

Because the same pattern of results held across the five studies summarized here, we can infer the ability of cooperative learning to increase equity is robust. Using experienced teachers and student teachers, the studies examined a range of cooperative learning methods, different curriculum content, different age students, and students in different geographical locations. The same pattern of results emerged across all the studies: All students learn more from cooperative learning and minority students learn dramatically more, closing the achievement gap. What can we conclude from the meta-analyses and the individual studies?

***Cooperative Learning = Greater Excellence + Greater Equity.***

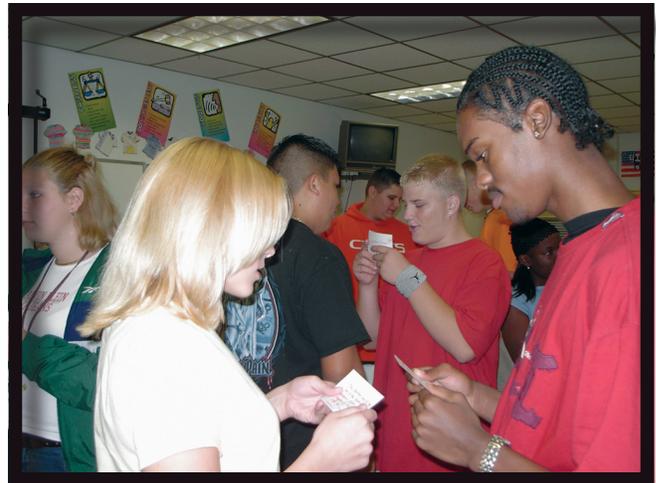
### **Explaining the Results**

There are many reasons cooperative learning accelerates both excellence and equity. I have offered a very detailed explanation in a chapter called, *Why Does Cooperative Learning Work?*<sup>12</sup> The explanations include:

- Positive Interdependence, Individual Accountability, Equal Participation, and Simultaneous Interaction
- Immediacy and Frequency of Feedback and Reinforcement
- Immediacy and Frequency of Correction Opportunities
- Peer Modeling, Encouragement, and Tutoring
- Improved Brain Chemistry and Function
- Multi-Modal Stimulus Input

- Greater Novelty
- Focused Attention
- Creation of Episodic Memories
- Enhanced Safety and Predictability of Instructional Sequences
- Satisfaction of Need for Security
- Heightened Teacher and Pupil Expectations
- Instruction Tailored to Individual Differences in Intelligences and Learning Styles
- The Power of Situations

We won't overview those explanations here. Rather, we will describe two dynamics that were not detailed previously, both of which help explain enhanced excellence and equity: Classroom Climate and Ethnic Relations. The Riverside Cooperative Learning Study<sup>13</sup> demonstrated cooperative learning produced more inclusive classrooms. This was revealed by several measures, including measures of cooperativeness of students, class climate, self-esteem, and ethnic relations. Students taught with cooperative learning became more cooperative: When presented with alternatives, they more often chose to enhance rather than diminish the outcomes of their classmates. Rating of social climate, as measured by standardized class climate measures, improved markedly for minority students in cooperative learning classrooms. Self-esteem has three factors: Intellectual self-esteem (eg., "I am smart"); peer self-esteem (eg., "I have many friends") and family self-esteem (eg., "My family cares for me"). Results of the Riverside Cooperative Learning Study, like other studies of cooperative learning and self-esteem, revealed that students taught with cooperative learning increased in both intellectual and peer self-esteem, with no change in family self-esteem. This, of course, is not surprising as the students were performing better in school, and peers were kinder to them.



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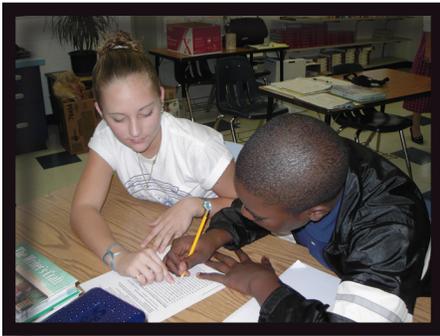
The most dramatic finding, however, was a radical transformation of race relations. To test race relations, students were asked a number of questions that revealed their level of intimacy with each of their classmates. Questions included low-level intimacy questions (willingness to sit next to a student; willingness to loan him or her a pencil) and high-level intimacy questions (willingness to be best friends; willingness to invite him or her home). The results were dramatic. In traditional classrooms, self-segregation among students became more intense with each year in school. Increasingly, students were not willing to be friends or even be friendly with others outside their own race. In contrast, in classrooms in which cooperative learning was used, the tendency of students to choose friends only among their own racial groups practically disappeared:

In grades 2-4, in the traditional classes, there was a slight tendency for the minority and majority students to manifest more friendliness toward others of their own group. By grades 5 and 6, this slight ethnic cleavage became an enormous chasm: Being of the same ethnicity became almost a prereq-

uisite for friendship. In marked contrast, there was no significant ethnic cleavage at either grade level in the classrooms that included cooperative student teams. (p. 306-307)<sup>13</sup>

Cooperative instructional practices create an inclusive classroom climate in which self-esteem and positive race-relations blossom. That climate improves academic achievement for all students, especially for students who otherwise are likely to be excluded and alienated. Students who feel more accepted and included are more likely to participate, ask for and offer help to peers, and receive peer encouragement for achievement.

A more inclusive classroom and higher self-esteem predict more participation, which in turn boosts engagement and achievement. Students who feel more liked and accepted and who are more confident are more likely to participate, feeling less fear of failure.



Greater participation is built into the cooperative learning structures. When we analyze the difference between traditional and cooperative classroom instructional practices, we find an obvious explanation of the progressive achievement gap in traditional classrooms. When cooperative learning is not used, the most common strategy teachers use to produce active engagement among students is to ask a question and then have students raise their hands to be called upon to answer. But who raises their hands and who does not? When we use traditional instructional strategies shy, insecure, unmotivated, alienated, and low achieving students often hide — they simply do not raise their hands. With regard to producing active participation,

the traditional structure is extremely biased in favor of the high achievers. We end up with a subgroup of students who often or always participate, and another subgroup of students who seldom or never participate. In the traditional classroom, we call most on those students who least need the practice, and we call least on those who most need the practice! When cooperative learning structures are used, the teacher may ask the same question of students, but does not call on one to respond. Rather the teacher calls on all students to respond, having them engage in structures like RallyRobin or Timed Pair Share. In the same amount of time that a teacher in the traditional classroom can call on and respond to three or four students, each giving one response, the teacher using cooperative learning structures has every student in the class give several answers! Neuroplasticity predicts the learning result: To learn is to grow dendrite tracks. Neurons that fire together wire together. If we use neuron tracks, we grow them; if we don't, learning does not occur. The results of brain research parallel the results of classroom participation: Use it or lose it! In traditional classrooms we stimulate and grow the brains of our higher achievers, but fail to stimulate and grow the brains of those most in need. With cooperative learning structures in place, we grow all brains.

This analysis partially explains the progressive school achievement gap as well as differential drop-out between low achieving and minority students. Beginning in the early grades, low achieving and minority students are less likely to participate and to risk failure in front of the whole class in traditional classrooms that lack a supportive, inclusive class climate. Not receiving as much practice or

reward, they become even lower achieving, more alienated, and even less likely to participate. So, as they progress through the grades, lower achieving students in traditional classrooms increasingly leave it to the high achieving students to raise their hands to be called on. With each successive grade, our lower achievers progressively drop out psychologically, participating less and less. Finally, psychological dropout converts to physical dropout. Dropout is refusal among low achieving students to continue playing a losing game.

Mills Hill Elementary School in England has posted extremely dramatic gains in excellence and equity by adopting Kagan Cooperative Learning Structures. As part of a leadership team cross-school survey of the impact of cooperative learning,<sup>14</sup> teachers attributed the gains to the peer support in cooperative learning compared to the isolation and alienation created by traditional instructional strategies. Some teachers were choked up as they described the transformation resulting from cooperative learning:

“It was a real lump in your throat moment; they’d say, ‘before you just sat there and you didn’t know what was going on and you were frightened to ask, but now you can just ask your friends, or ask your team’. You just got an idea of how that child had been going through school and you just don’t realise; it was a very powerful moment.”

Students at Mills Hill explained the power of cooperative learning quite simply:

“Working with my team helped me do things I couldn’t on my own. We did this thing on our table called RallyRobin and you talk with your partner and take turns in sharing ideas.”

The failure to create engagement among all students in the traditional classroom extends beyond Question-Answer time. During independent practice, students are on their own. With little to no support, they often find repeated worksheet work boring or difficult, and often tune out. In contrast, students in the cooperative learning classroom are placed in teams. The instructional strategies are designed so that students are on the same side as their teammate; there is a high degree of interaction; everyone is held individually accountable for participating. In engaging structures like Sage-N-Scribe and Pairs Compare, students take turns responding, receiving encouragement and praise, and tutoring if necessary. Students keep each other engaged. It is this greater engagement of all students that best explains the increased excellence and equity that we find. We need only observe the dramatic, intense engagement among all students to comprehend the remarkable outcomes of cooperative learning research. Structural conditions encourage full and equal participation for all students. Plus students have the support of their peers. Simply put, cooperative learning engages every student while traditional instruction engages a select few. Why would we consciously elect to engage just our elite students when we can just as easily engage every mind in the classroom?

**Cooperative learning engages every student while traditional instruction engages a select few. Why would we consciously elect to engage just our elite students when we can just as easily engage every mind in the classroom?**

## The Instructional Solution

We have in our hands simple yet powerful tools proven to accelerate both excellence and equity. We have a research-proven, school-tested solution to educational recovery. To revolutionize educational outcomes we need only to invest in our teachers. We need only to train our teachers in proven instructional strategies and create ongoing support for their implementation. The need is clear. The data is in. We lack only the will. We have it in our power to create a schooling system aligned with our drive for excellence and our commitment to democratic principles. In the face of the evidence, why would we choose educational practices that engage only some learners? Why would we call on one student when in the same amount of time, we can call on all students? Why would we continue to tolerate practices that foster alienation and drop out for some of our pupils, if we can easily create fully inclusive classrooms that foster a realization of full potential of every student?



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