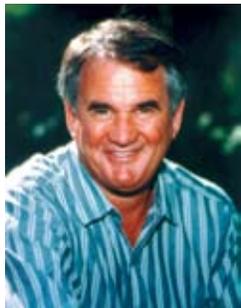


The Instructional Revolution

Dr. Spencer Kagan



As the world around them changed, schools did not. At least they did not change in the most important way they needed to change—how teachers teach. Instructional practices in schools have remained

remarkably resistant to change. This is true worldwide. I have now trained teachers and observed classrooms in over twenty countries. Wherever I go, whether it is into schools in industrialized cities in wealthy countries, or rural towns and villages in poor countries, instructional strategies are remarkably similar. They are similar to each other and similar to what they were several hundred years ago.

Traditional Instructional Strategies

Let's review two of the most commonly used traditional instructional strategies: 1) The way we have students respond to teacher generated questions, and 2) The way we have students practice a teacher demonstrated skill.

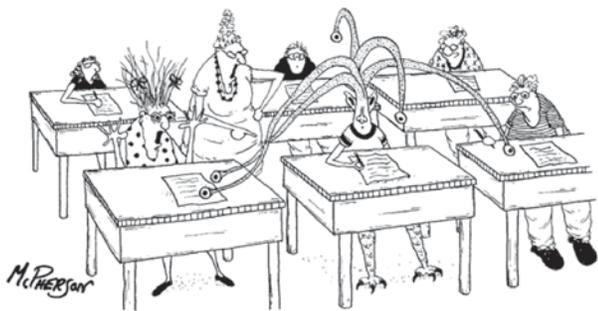
Answering Teacher Generated Questions. To check for understanding, to generate active participation, and/or to reinforce a correct response, a traditional way to structure the interaction in a classroom is the familiar Teacher-Student Question-Answer. The teacher asks a question of the class and students who know the answer wave their hands, hoping the



Traditional Structure: During Teacher-Student Question-Answer, the teacher calls on one student. None of the other students has the opportunity to articulate their thinking through verbalization; they either passively listen, or tune out.

teacher will call on them. The teacher then calls on one student, and that student gives an answer, hoping for approval from the teacher. For example, the teacher may ask, "What is a good adjective to describe the main character in the story?" For questions that have more than one right answer, the teacher may call on several students, one after another.

Practicing Teacher Demonstrated Skills. To have students practice a teacher-demonstrated skill, a traditional way to structure the interaction in a classroom is Solo Worksheet Work. The teacher demonstrates the skill and then has students work alone applying the skill to new problems, often provided in the form of a worksheet, problems on the board, or problems at the end of a chapter. Often students are



“LEON! KEEP YOUR EYES ON YOUR OWN PAPER!!”

Source: *For Whom the Late Bell Tolls* by John McPherson
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admonished to work alone, to “keep their eyes on their own papers.” For feedback and evaluation, students turn in their worksheets; the teacher grades them; and the teacher then passes back to students the corrected and graded worksheets.

Revolutionary Alternatives

What is remarkable about these traditional ways of structuring the interaction in classrooms, is that we can go almost anywhere in the world and/or go back in time several centuries in almost any country and observe these approaches to instruction operating almost unchanged. While the world advanced through the agricultural, industrial, and information revolutions, schools failed to advance through instructional revolutions.

But we are about to.

Let’s consider alternative ways to structure the interaction in classrooms and their advantages over the traditional approaches. At Kagan for almost 40 years we have been experimenting with, researching, and developing alternative ways to structure classroom interactions. We have now developed over 200 instructional strategies designed to engage different types of thinking and learning. These innovative strategies, known as Kagan Structures, radically transform the way students and teachers

interact. They are fresh, creative, easy to implement and enjoyable methods that enliven the classroom and greatly enhance learning. In this article we will focus on just three of the more than 200 Kagan Structures: RallyRobin, Timed Pair Share, and Sage-N-Scribe.

Answering Teacher Generated Questions:

RallyRobin. Let’s take the example of the teacher who wants the students to think of adjectives to describe a character in a story. Instead of calling on one student after another, each to name one adjective, the teacher could use RallyRobin. The teacher would have students form pairs and then say, “Turn to your partner and do a RallyRobin: Take turns naming adjectives to describe the main character.” Partners then take turns naming adjectives.

Advantages of RallyRobin. In the same amount of time that the traditional teacher can call on and respond to at most four students in the class, each giving one answer, by using RallyRobin the teacher has every student in the class give many answers! Compared to the traditional approach, RallyRobin works miracles for active participation. Would we rather have four students think of and give one answer each, or would we rather have *every* student in the class think of and verbalize several answers? If our goal is to have students think of many possible answers to a question, in effect, to



RallyRobin: Primary students in Sydney, Australia

generate an oral list, RallyRobin accomplishes the goal far better than does Teacher-Student Question-Answer. Younger students might do a RallyRobin to name colors or to create or devise possible alternative endings to a story. Older students might RallyRobin prime numbers, inert elements, possible causes or consequences of an historical event, or literary techniques. Because, like all Kagan Structures, RallyRobin is content free, it is used at all grades with a very wide range of academic content.

Answering Teacher Generated Questions: Timed Pair Share.

No one structure is best for all types of thinking. If our goal is to have students elaborate their thinking in depth rather than to generate a list of answers, Timed Pair Share works far better than RallyRobin. In Timed Pair Share students in pairs

each speak for a predetermined amount of time, usually for a minute. Their partner gives them undivided, uninterrupted attention. Sample content for Timed Pair Share includes: Tell your partner about the picture you plan to draw. What are three alternative hypotheses that could explain your data, and which do you think is the best? Which adjective do you think best describes the main character and why? Explain what you think were the most important consequences of World War II? What is one literary technique you plan to use in your story and how will you use it?

Advantages of Timed Pair Share. As with RallyRobin, during Timed Pair Share, in the same amount of time we might call on and respond to two or three students, each sharing for a minute, we have every student in the class share for a minute. Again, we generate a miracle of active

engagement. Because students are talking directly to a partner, they are far less likely to tune out compared to when they are looking at the back of the head of someone responding to the teacher. Through Timed Pair Share students learn to listen attentively to a peer, acquiring active listening skills such as eye contact, and showing interest.

The advantages of RallyRobin and Timed Pair Share, however, are not limited to increasing active participation. There are many advantages.



Timed Pair Share: Carrbridge, Scotland

By using these active engagement structures, students who do not participate in the traditional classroom become engaged. Many students are too shy, find it too risky, or are too limited in their language fluency so will not raise their hand to answer in front of the whole class. Those same students are quite comfortable and

become fluent interacting with just one other student. In each class, isn't it always the same handful of students with their hands waving to be called on, and another subset of students who never raise their hands? With RallyRobin everyone participates, not just the high achievers.

How we structure our classrooms communicates values. The meta-communication from teacher to students with the traditional class structure of calling on those who know, is that some know and some do not. Some are better than others. My job as a teacher is to evaluate. There is a very different meta-communication with RallyRobin and Timed Pair Share: We all have ideas of value to share. My job as a teacher is to allow you to express and elaborate your thinking. We are all part of a community of thinkers and learners.



RallyRobin: Madrid, Spain

The identity and self-esteem of students improves in classrooms in which RallyRobin and Timed Pair Share are used. With the traditional structure, we create winners and losers, some who know and some who do not. Those who don't raise their hands leave class feeling inferior to those who always know the answer. The message: Some of us are better than others. With RallyRobin and Timed Pair Share there is a very different message: We all have important contributions to make. With the interactive structures we equalize status and students all leave class with a feeling of worth.

Students develop social skills during RallyRobin and Timed Pair Share that they do not acquire in the traditional class. They learn to listen to and respect their peers. Because everyone responds, not just the high achievers, the meta-communication in the class is everyone has unique contributions of value, not just the high achievers. Because during RallyRobin and Timed Pair Share students each turn to face a partner, talking directly to them, they hold each other on task. Their level of engagement increases dramatically.

Students do not come to school to see us! With interactive structures, students get to do what

they most want to do—interact with their peers. Liking for school, class, and subject matter increase because students are more engaged and because thinking about the content is within an enjoyable context.

Another advantage of the interactive structures over the traditional approach is authentic assessment. One reason to have students verbalize their thinking is so we can assess their level of thought. With the traditional approach, we hear only from the high achievers or those that think they know the answer, so we sample a highly skewed segment of the class. As students do a RallyRobin or Timed Pair Share, we listen in to a representative sample of the class obtaining a much better understanding of the level of thinking of our students.

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Because RallyRobin and Timed Pair Share are content-free instructional strategies, they are powerful at any grade-level with any academic content. Kindergarten students may do a RallyRobin naming community helpers; older students may do a RallyRobin to review events from their history chapter.

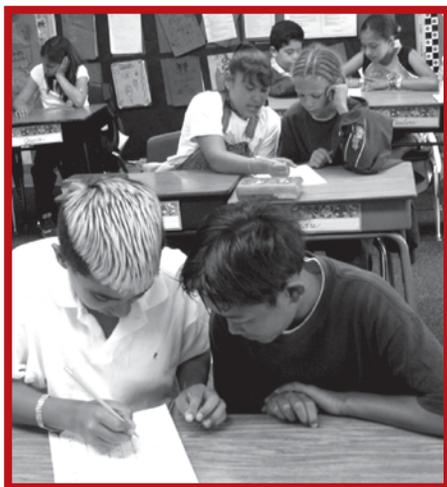
Functions of Teacher Questions. We ask questions of our class for a variety of reasons, including: 1) To check for understanding; 2) To create active engagement; and 3) To promote thinking. Regardless of the function, the interactive structures are far more efficient than the traditional approach of having one student at a time respond. If we want to check for understanding, we listen in as students respond. In this way we don't hear only from the high achievers. The result: a far more representative sample of our class. If our goal is to create engagement, we are better off having all students respond rather than just a few. The interactive structures also serve better to foster thinking. If it is a multiple response question and we use the

traditional structure and call on each student to give one response (objects that float, elements that combine with Oxygen), each student thinks of only one response. In contrast, in RallyRobin each student thinks of many responses. Further, the traditional structure pushes us to ask brief-answer questions because we know a very lengthy response by one student will result in boredom and disengagement by many in the class. We end up playing trivial pursuit. In contrast, if we are using Timed Pair Share, we feel comfortable posing long-answer questions. We are comfortable allowing students to elaborate and articulate their thinking at length, knowing all students will be engaged.

There is an additional reason teachers may ask a question of the class: The teacher may ask a difficult question knowing only some of the students know the answer. They may either want to reward those who do know the answer, or want to have a high-achieving student verbalize a correct response as a model for the



Sage-N-Scribe: Des Plaines, Illinois



Sage-N-Scribe: Lake Alfred, Florida

others. In our view, we should not be asking questions for these reasons. We can serve as a better model than can the student we happen to call on, and what we win in rewarding those who know, we lose in making others feel inadequate. Asking questions we know many or

most students cannot answer creates a subset of losers in the classroom. They leave class with diminished self-worth and are quite likely to dislike class content, teacher, or school—or all three!

Practicing Teacher Demonstrated Skills: Sage-N-Scribe.

Instead of passing out worksheets and having students work alone to practice a skill, a teacher can break with tradition by using a Kagan Structure for active engagement. There are many mastery structures to choose from, but let's examine just one—Sage-N-Scribe. Students are seated in pairs with one worksheet. For the first problem Student A (The Sage) tells Student B (The Scribe) exactly what to write or do as the Scribe carries out the instructions given by the Sage. The Scribe may coach if the Sage needs it, and congratulates the Sage upon problem completion. The students switch roles after each problem so the Scribe becomes the Sage.

Advantages of the Alternative Structure. As simple as this structure is, it has numerous advantages over having students work alone. A Geometry teacher described one of the most important advantages of the alternative structure. At last year's Kagan Summer Academy, an older teacher approached me and told me the following:

I came back for a second year of summer training for one reason: I have been teaching

Geometry for over 20 years and after last year's training, my students finished two full chapters more than they ever had. I did not think it was possible!

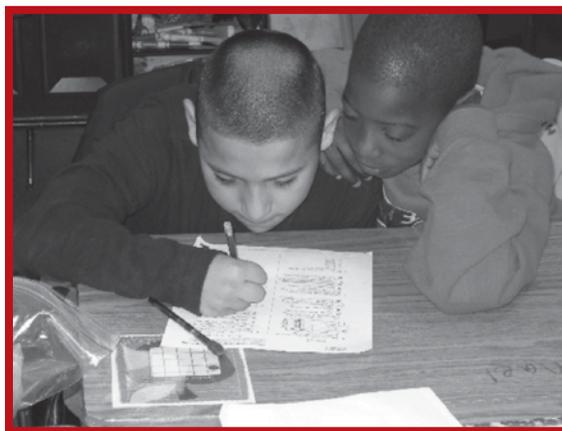
I was somewhat taken aback and asked her, "If you formed teams, did teambuilding, and classbuilding, and even some Silly Sports, and took time to teach the students new structures, how could you possibly get through so much more curriculum?" She explained,

In the past, I would demonstrate at the board, then have students practice dependently, assigning the problems at the back of the chapter for homework. Each class period we would spend up to fifteen minutes going over the homework, working on the problems students had missed. When we put Sage-N-Scribe in place, students got their correction opportunities before doing their homework, so they hardly ever missed problems on the homework. We saved all that class time!

Sage-N-Scribe allows guided practice before individual practice. This ensures students are successful during independent work.

Breaking from the traditional solo practice structure does a great deal more. In the traditional method, students do not get feedback on their work until the teacher has had time to correct, grade and return their papers. With Sage-N-Scribe, students get immediate correction opportunities. They cannot practice a whole worksheet wrong. Further, reinforcement is peer based and students work harder for praise from a peer, than for a mark from the teacher.

Peer norms in the classroom change radically. In the traditional approach when the teacher passes back the graded papers, there is a negative social comparison process: Who got the best grades? Who is up? Who is down? Who beat whom? Students experience themselves in competition with each other. With Sage-N-Scribe students feel themselves to be on the same side; the structure creates a community of learners eager to help each other.



Sage-N-Scribe: Leander, Texas

Another advantage, of course, is that students are verbalizing their thinking. As they verbalize, they listen to themselves. They become more aware of their own thinking, more focused, and more likely to self-correct. The structure fosters meta-cognition—thinking about one's own thinking. At the same time the students become more aware of the thinking of others. They listen to their peers. Lower achieving students have the advantage of listening to higher achieving students who model correct ways to approach problems.

Students acquire social skills as they work together to complete their worksheets or problems. Rather than working in isolation, the students are listening to, coaching, and praising each other. In mixed racial classrooms, race relations improve dramatically when students work together cooperatively. Research demonstrates they more often make cross-racial friendship choices, and both cafeteria seating patterns and playground play patterns become more integrated.

Another of the advantages of interactive structures is that they align instruction with the stimulus level to which modern students have become accustomed. When I was a student half a century ago, there were no DVDs, GameBoys, MTV stations, Tivos, color TVs, iPods, video games, Wiis, or web based forms of information

and interaction. The teacher was the most exciting thing in our environment. We listened to the teacher with fixed attention because the teacher was a source of stimulation. Today, the interest level a teacher can provide pales in comparison to all the other sources of stimulation to which students are constantly exposed. To have students work alone, for many students today, in their words, is “just plain boring.” In contrast, interactive structures provide rich stimulation and are more aligned with the stimulus level today’s students have become accustomed. Students can capture and hold each other’s attention far better than can problems on a piece of paper to be worked on alone. Today’s students have more interesting things to do. In essence we are in competition with media, and our best tool in this competitive game is to create a stimulus rich learning environment. And there is no stimulus more engaging for most students than other students.

Like with RallyRobin, Timed Pair Share and all the other interactive structures, during Sage-N-Scribe, students are getting to do what they most want to do: Interact with their peers. The experience of working in an enjoyable context translates to more love of learning. The most common thing students answer when asked about what they think about working in structures is “It’s fun!”

Enrichment, Not Replacement. Although there are many advantages to adding interactive structures to our instructional repertoire, those of us advocating structures are not advocating a replacement model. We are not saying, “Never call on one student and never have students work alone — use interactive structures instead.” Rather, we are advocating intelligent choice. We want to add to the instructional options available to teachers. Students need to learn to sit quietly

and work alone. They need to respond with their own answers without interacting. They also need to know how to work with others. By adding interactive structures to our toolbox of instructional strategies, we enrich the experiences of students, providing a broader set of skills. By asking the question, “How do I want to structure the interaction in my classroom at this moment?” we are able to intelligently choose rather than unthinkingly adopt the way of the past. We become more reflective, sometimes choosing interactive structures and sometimes choosing traditional structures, depending on our goal.

Empirical Research Results. The advantages of using interactive structures described here are supported by a great deal of empirical research. Hundreds of research studies show cooperative learning leads to increased achievement, reduction of the gap between low and high achievers, improved social skills and social relations, improved ethnic relations, increased self-esteem, and greater liking for teacher, school and academic content.¹ Details of numerous empirical research studies demonstrating the positive effects of Kagan Structures can be viewed on the Web: <http://www.KaganOnline.com/research>

Resistance To Change

It is amazing that with more powerful alternatives readily available, there is such widespread adherence to inefficient traditional instructional strategies. Why? It is not because the alternative structures are difficult to learn or implement. Few instructional strategies are easier than a simple RallyRobin, Timed Pair Share, or even Sage-N-Scribe. A great deal can be said about why we stick to non-adaptive habits. Therapists spend years with clients, often with

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little success, trying to wean them from self-defeating patterns of behavior, trying to get them to adopt simple behavior patterns that will serve them and others better. Let's examine a few of the dynamics that make teachers and schools so resistant to change.

Modeling and Mirror Neurons. As a new teacher, when we first stood in front of our class to teach and it was ten minutes into the lesson, without prior thought we asked a question of the class. The students who thought they knew raised their hands. We called on one. The student answered and we gave either a compliment or a correction. That interaction sequence was not in our lesson plan. Why did we carry it out with no planning? We had observed that sequence so many times that it was burned in our brain. It was simply what teachers and students do in classrooms. We now know that when we observe a behavior performed by others, our mirror neurons fire as if we were performing that behavior. We actually practice behaviors by watching them. Before we became teachers, as students, we observed traditional instructional strategies so many times, we were primed to carry them out when we became teachers. Further, the work on neuroplasticity shows that the more we practice a behavior, the more space it occupies in the brain and the harder it becomes to change. We actually become hard-wired for traditional structures. But history is not destiny: neuroplasticity means we have the capacity for change. By practicing these simple interactive structures we re-wire our brains to make teaching both easier for ourselves and more effective for our students.

Three Fear Factors. Some who have noticed the resistance to change, have blamed teachers, accusing them of fear of failure, fear of the unknown, unwillingness to admit one does not

know everything, and even laziness. But resistance to change most often comes from legitimate fears from well-intended, motivated, intelligent teachers. It turns out, though, analysis reveals those fears are unfounded.

Fear Factor 1. Students will share wrong answers. In traditionally structured classrooms, we have the luxury of hearing (and correcting if necessary) everything that is said. If students answer only to us, we can correct any misconception they verbalize. It is very discomfoting for many teachers to abandon that structure and adopt new interactive strategies that mean many things will be said that we will never hear. One of the most common questions I get in giving workshops is, "What if students share wrong answers?"

Let me assure you: Wrong answers will be shared! There is no way around it. When we use interactive structures, some students will

verbalize wrong answers that we will never hear and never be able to correct. As counterintuitive as it seems, though, we still win dramatically in the bargain. Why? Well, which students have the wrong answers in their heads—the high or low achievers? It is the weaker students who have misconceptions, and in traditional classrooms it is precisely those students we seldom or never call on. They simply do not raise their hands. The result: They leave class with their misconceptions uncorrected! When we introduce interactive structures, all students verbalize their ideas and their ideas then become subject to correction opportunities. We set up a norm in the classroom: If anyone hears an answer that they are not certain is correct, we stop and check it out. Because we have heterogeneous teams, low achievers are interacting with higher achievers, increasing the probability of correction opportunities. When we use interactive strategies, not all wrong answers are corrected, but a much higher percentage of wrong answers are corrected

Three Fear Factors

1. Sharing Wrong Answers
2. Off-Task Behavior
3. Losing Control

than when we use traditional strategies. When we use traditional methods, most wrong answers are never verbalized, so go uncorrected.

Fear Factor 2. Students will get off task. The second fear factor is that if we cannot hear all that students say in our class, students will get off task. Again, let me assure you: Students will get off task! But again, we win in the bargain. How is this possible? In the traditional classroom, students are called on one at a time. This means that only one student is verbalizing and the other students are relatively inactive. While looking at the back of the head of a student answering the teacher, many students find more interesting things to think about than the answer being given by the one student who was called on. They fantasize. They daydream. They pass notes. They whisper. In the traditional classroom many students are off task—we simply don't know it. Far fewer are off task in the classroom using interactive structures because the students are holding each other on task. During RallyRobin, after my partner shares an answer, I have to share an answer. The structure holds me on task. During Sage-N-Scribe, we are both on task all the time because one is the Sage, saying what to do, while the other is the Scribe, carrying out the action.

Fear Factor 3. I will lose control. When I first began trying to convince schools and administrators to use cooperative learning methods, it was an uphill battle. In those days, a good class was a quiet class. Administrators equated silence with good classroom management. If no one was talking, the teacher was demonstrating control of the class. In fact, good classroom control is not keeping everyone silent and in their chair; good control is the ability to get the class silent and to get everyone seated and attentive when desired. A teacher who has everyone moving, interacting, and totally engaged and who can simply raise a hand and quickly

Today, we must prepare students for a very different world.

have everyone silent and with alert attention on the teacher is demonstrating far better classroom control than the teacher who never lets students talk or move. The use of interactive structures must be coupled with management signals, procedures, and routines. We cannot feel comfortable allowing students to interact if we are not confident that with ease we can get their focus fully back on us or on a task. At Kagan workshops we never train teachers in interactive strategies without coupling that training with the associated management strategies.

Traditional v. Modern Views of the Function of Schools. In the early days of industrialization, many viewed schools as having two major functions: 1) Socializing obedience and 2) Sorting. Many students were headed for assembly line jobs where obedience and conformity were highly valued. Preparation for those jobs placed little or no premium on thinking or creativity. Given that, schools placed a great deal of emphasis on following directions, obedience, and performing rote tasks repeatedly on one's own. It was important also to sort students—who would go on to design and own the factories and who would go on to punch a time clock? Separating the winners and the losers was a traditional function of schools, and our over-emphasis on competition and grading is a remnant from that era.

Today, we must prepare students for a very different world. Because of the accelerating change rate, we can't predict with any certainty the kinds of jobs our students will work in. We can say

with certainty, however, that our students will need social interaction skills. Three fourths of all new jobs involve working on a team at least part of the time, and that percentage is

increasing. Complexity and interdependence are the defining characteristics of the modern workplace—no one person can build a computer. Teams work to coordinate efforts with other teams. As we move toward interactive structures

The world is rapidly changing. It is time we change the way we teach.

in our classrooms we are aligning the classroom experience with the work world of the future. We are preparing our students with skills for success.

Traditional v. Modern Views of the Learner.

Traditionally we viewed learners as empty vessels and our job as teachers was to fill them with the knowledge and skills they would need for success. In the day when most people worked on farms, basic numeracy and literacy was sufficient. Today we cannot predict how our students will work.

The accelerating change rate means many of our students will work at jobs we can only dimly imagine. We are not certain of the technical and academic skills they will need. We can be certain, though, they will need social skills, teamwork skills, and thinking skills as they deal with the increasingly complex interdependent work world of the future. Further, they will have to become lifelong learners. Half of what an engineer learns in school is outdated five years after graduation.

And the half-life of knowledge is shrinking as technology is used to create new technology at an ever-increasing rate. Thus, our job as teacher has changed. Rather than filling our students with known facts and skills, increasingly we must see our job as fostering thinking skills as habits of mind and imbuing students with a

love of learning. We are moving away from the traditional, control oriented, sorting view of the function of school and away from the empty vessel view of students. We are moving toward a vision of school as the place where we foster maximum growth of the unique potential of each individual. Interactive structures align our practice with that vision.

The Instructional Revolution

What we teach has changed. Sources of information have changed. The jobs for which we must prepare our students have changed. The world is rapidly changing. It is time we change the way we teach. Traditional instructional strategies prepare our students for the world that was. Interactive structures prepare our students for the world that will be. The instructional revolution is inevitable.

Endnotes

¹ Kagan, S. & Kagan, M. *Kagan Cooperative Learning*. San Clemente, CA: Kagan Publishing, 2009.