

# ENGAGING THE ADOLESCENT LEARNER

BY DOUGLAS FISHER AND NANCY FREY



Collaborative  
Learning  
Ensuring Students  
Consolidate  
Understanding

"But I do productive group work all the time! Look, I've got all my desks in groups of four!" a middle school teacher told us.

"I just don't understand what my principal and the instructional coach keep talking about when they ask me to 'make it more collaborative.' Can you help?"

Her statement of frustration echoes the concerns of many teachers who have addressed the basic logistics of productive group work but have yet to witness a level of cognitive and metacognitive learning needed to achieve the kind of breakthrough results they hope to see. To be sure, teachers need to build students' skill and stamina each year. These are foundational, and the necessary work of doing so should not be dismissed as something that teachers and students should already know how

to do simply due to age. In truth, the difficulty students face has more to do with your expectations. After all, it's usually not a case of their inability to work productively. Chances are very good that they have had ample experience in previous grades. Rather, it is because they don't know how to work productively *for you*. Our June 2011 column, "[The First 20 Days: Establishing Productive Group Work in the Classroom](#)," discusses this issue and proposes solutions for getting started.

But what happens when that initial work is done? In this issue of the IRA Members Only column, we look more closely at the topic of increasing cognitive and metacognitive

complexity of the tasks in order to make group work truly productive.

## Contrasting Group Work With Productive Group Work

As the previously quoted middle school teacher discovered, productive group work is more than just pushing desks together. After all, small groups of students often sit together but work independently; they are simply sharing a space. An important first step to moving from working in isolation to group work is to increase interaction. It is essential for students to discuss ideas, solve problems, discover information, and complete projects. These basic interactions allow students to discover what others are thinking and get input from their peers. These exchanges give students a forum for clarifying their beliefs, values, or ideas in the company of others. Accountability is typically nonexistent, or in some cases may feature group accountability only, such as when a single product is turned in for the entire group.

In contrast, productive group work requires students to engage in extended discussions that require students to use argumentation. In other words, the discourse is elevated as groups exhibit a sustained focus on the problem at hand and a shared goal to resolve it. Productive group work tasks include the following (Mitchell, 2001):



- ◆ Discussion centers on the evidence provided to the group
- ◆ Claims that support the evidence are used by group members
- ◆ Evidence is reviewed
- ◆ Positive and negative outcomes associated with the proposed options are considered
- ◆ Discussion is sustained for an extended period of time
- ◆ Discussion is iterative and progressively advances toward the group's goal or stated purpose

In addition, each member of the group is individually accountable for his or her actions and contributions. Given that productive group work focuses more explicitly on resolution

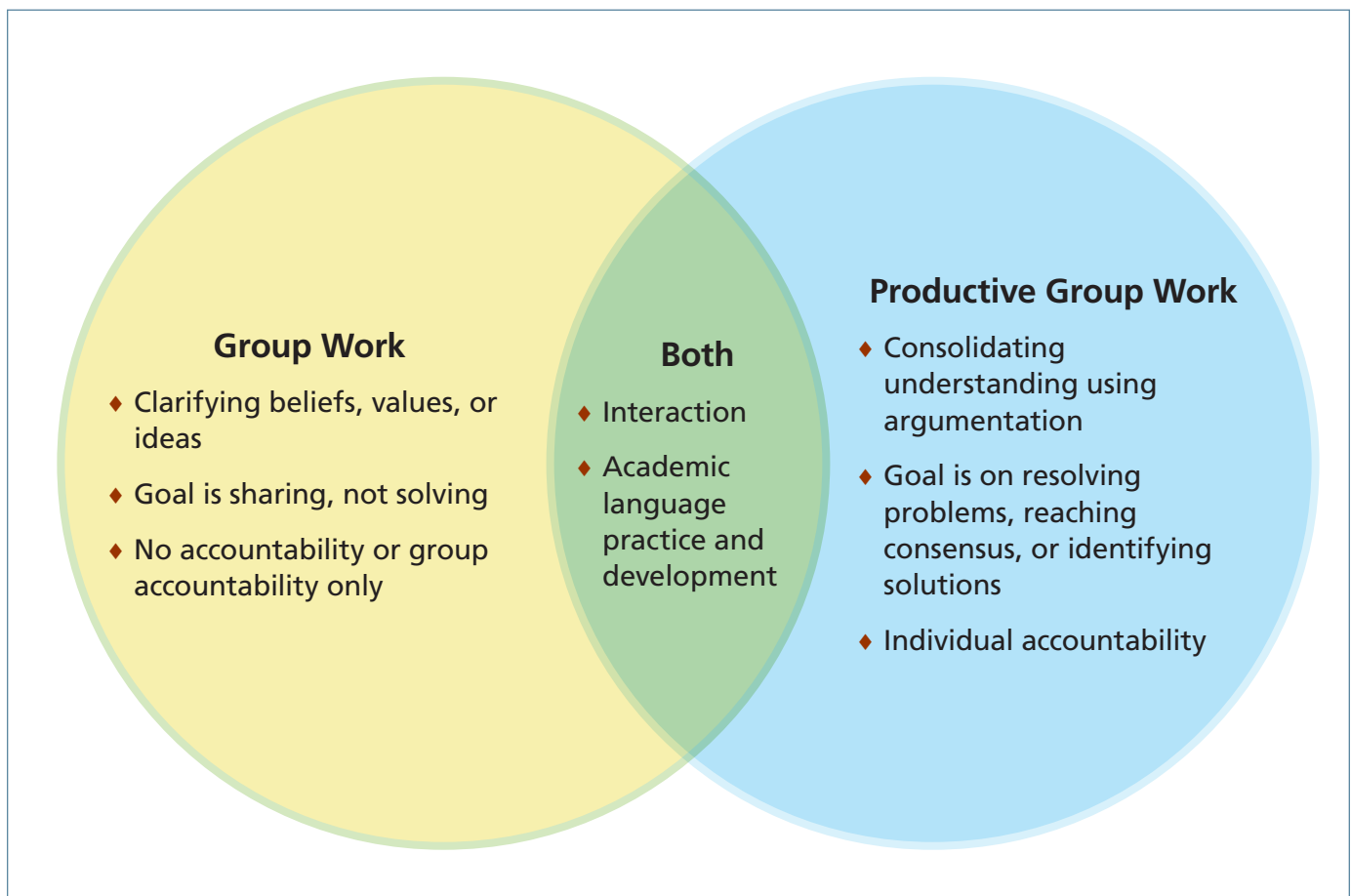
of a problem, it makes sense that each participant should have a stake in the outcome. Although the basic interactions of group work may lick at the boundaries of argumentation, discourse, or accountability, it becomes productive when the group's goal centers on resolution rather than simply sharing. Figure 1 illustrates the commonalities of both, as well as the features unique to each.

### **Examples of Basic Group Work**

Group work routines that promote discussions focused on sharing include TTYPA ("turn to your partner and..."), as well as variations of Think-Write-Pair-Share, which invite students to contemplate their perspectives and take into account the views of others. Seventh grade mathematics teacher

Maureen Tracey does this each time she posts a problem. "Take a good look at this and calculate it," she tells them. "Remember to notice your own mathematical thinking as you do so." After solving the problem, she asks them to check in with their math partner. "Share your answer, yes, but don't stop there. Find out what he or she answered, and talk about how you solved it." After a few minutes of paired discussion, they're primed for whole-class sharing. "I find this to be really effective with some of my quieter students, as well as with many of the girls. Because they get a chance to check in with someone else first, they're more confident about talking in front of the whole group," Ms. Tracey remarked.

Other group work routines require students to assemble into temporary groups for the purpose of sharing



**FIGURE 1** Comparing and Contrasting Group Work and Productive Group Work

ideas and concepts. U.S. government teacher Greg Swanson uses Opinion Stations so that like-minded students can clarify their understandings, then engage with others who have different opinions from their own. He has posted four statements spaced far apart around his classroom: Strongly Agree, Agree, Disagree, and Strongly Disagree (“No neutrals in this class,” he said. “Have an opinion, defend it, and listen to the opinions of others.”).

During a unit on legislative governance, he posted the proposed congressional redistricting map for their region and discussed some of the changes, then displayed a quote from the local newspaper’s editorial section: “This process of redistricting has become a highly partisan tussle, at the expense of the voters in our county.” Without further discussion, he asked his students to move to the poster that best described their opinion. In the first round, the assembled groups discussed their shared point of view. After a few minutes, he then moved them to a second round of discussion, this time with members of another group with an opposing opinion.

“I usually group the Strongly Agrees with the Disagrees, so they are not so far apart,” he said. After the second round of discussion, students could change their opinions. “That really is the process we should be used to in our government processes,” he offered. “Open debate about the issues, with opportunities to change one’s opinion based on discussion.”

English teacher Elian Cruz uses Novel Ideas Only to get lots of ideas out in the class in a short period of time. “I often have them working together to make a list of ideas,” Mr. Cruz said. “But the sharing part can be kind of tedious, especially when the group’s answers are similar. We do this to promote more active listening.”



After reading the short story, “An Occurrence At Owl Creek Bridge” by Ambrose Pierce, groups met to discuss the characteristics of the protagonist, Peyton Farquhar. “As you make the list, be sure to cite where the text supports your answer,” he told them. After ten minutes, the groups had generated nearly 50 examples. Many of these duplicated the work of other groups, so Mr. Cruz used this instructional routine as a way for the groups to report their findings. After asking all the students to stand, each group reported one example from their lists, and crossed off items reported by other groups. As each list was exhausted, the groups sat down. Within a few minutes, 12 unique examples were shared and discussed, thereby eliminating the tedium of duplication.

Earth science teacher Holly Cohn frequently uses a Carousel to foster interactions. After groups work out a problem or question and record their ideas on chart paper, they rotate to view and discuss the other groups’ charts,

adding their ideas to each chart. In order to ensure that the conversations don’t become repetitive, she poses a different question for each group.

At the introduction of a unit on rocks and minerals, she assigned each group a different question:

- ◆ What is our state’s principal natural resource? Why do you say so?
- ◆ What is the rock cycle? Why do you say so?
- ◆ What are the differences between a rock and a mineral? Why do you say so?
- ◆ Does our state have more sedimentary, metamorphic, or igneous rock? Why do you say so?
- ◆ Where does soil come from? Why do you say so?
- ◆ Give an example of a common use of a rock or mineral. No repeats!

## The following five features should be considered in any collaborative task.

(Fisher & Frey, 2008; Johnson, Johnson, & Smith, 1991)

- 1. Positive interdependence** Members must see how their efforts contribute to the overall success of the group. The task cannot be one that individuals could have completed independently. Rather, the task has to have at least an aspect of interdependence such that students need each other to complete their work successfully.
- 2. Face-to-face interaction** As part of the task, group members have to have time to interact live. Although they can also interact in virtual and electronic worlds, our experience suggests that the opportunity to interact on the physical level encourages accountability, feedback, and support.
- 3. Individual and group accountability** As we have noted, productive group work is not simply having a group of students complete a task in parallel with peers that they could have done alone. Having said that, we also know that the risk of productive group work lies in participation. In nearly every group, there are likely members who would allow their peers to complete the required tasks. To address this, each member of the group must be accountable for some aspect of the task. Of course, this is a perfect opportunity to differentiate based on students' needs and strengths. In addition to the individual accountability, the group must be accountable for the overall product. This also ensures that students who are overly involved from monopolizing the conversations during productive group work.
- 4. Interpersonal and small-group skills** One of the opportunities presented during productive group work is social skill development. Wise teachers are clear about their expectations related to interpersonal skills and communicate these expectations to students. For example, during a group brainstorming session about ways to represent the concept of slope, Heather reminds her students that "put-downs for ideas are not allowed, especially during a brainstorming session."
- 5. Group processing** As part of the learning associated with productive group work, students need to learn how to think about, and discuss, their experiences. The goal of the discussion is for students to consider ways that they can improve their productivity and working relationships.

Source: Fisher, D., Frey, N., & Anderson, H. (2010). Thinking and comprehending in the mathematics classroom. In K. Ganske & D. Fisher (Eds.), *Comprehension across the curriculum: Perspectives and practices K-12* (pp. 146-159). New York: Guilford.

"This gets them thinking about some of the material that we'll be learning during this unit," Ms. Cohn said, "and it gives me a quick way of gauging their background knowledge. I can see the charts and listen to their conversations. And I can listen for their misconceptions, too."

Interactions such as Think-Write-Pair-Share, Opinion Stations, and Carousel are essential for establishing the practice of listening and talking with one another about academic topics. As well, these basic interaction routines occur throughout the school year and should not be viewed as only being appropriate for novice learners. After all, the need for students to share their thoughts and hear the ideas of others doesn't diminish with time and experience. But as students become more accomplished at group work, it's time to shift to group work that is truly productive.

### *Examples of Productive Group Work Using Texts*

As noted earlier, group work becomes productive when three elements are present:

1. The discussion requires argumentation, not just sharing.
2. The group's task is to resolve a problem, reach consensus, or identify a solution.
3. There is individual as well as group accountability.

For example, Reynaldo Guzman uses an adaptation of Conversation Roundtable (Burke, 2002) routinely in his Algebra II course. "I post a problem on my interactive white board and then ask students to move into groups of four," he said. "Each person folds a sheet of paper into four quadrants, then folds the inner corner into a triangle, where they will eventually write the solution."

(An example of this appears in Figure 2.) Each assumes responsibility for a specific role:

- ◆ Explain in words what the problem is asking you to do.
- ◆ Draw a visual representation of the problem.
- ◆ Propose an estimation of the solution and defend its reasonableness.
- ◆ Propose a method for checking the proposed solution.

Individual members of the group take the lead on their assigned conversation element while the other members take notes and contribute ideas. After the group has completed the roundtable, they calculate the solution independently in the center of the page. Mr. Guzman invites a group to use a similar graphic on the interactive whiteboard to explain their mathematical thinking to the class. “By going through this process, really slowing down, they get the idea that it’s as much about their thinking as it is about finding the ‘right’ answer. I really like it when another group realizes that they used a different path to get there,” he said.

In the American literature class down the hall, Karlene Palmer’s students use an adapted version of Literature Circles (Daniels, 2002) that is developmentally appropriate for her adolescent students. “I adhere to some of the major principles, especially in ensuring choice from a list of texts I have identified,” she said. “Early on, I form the group based on their selections, but later in the year I will group them first and then press them to reach consensus on the text they will read.”

Group members have a number of responsibilities, including creating a plan for reading the book, scheduling their meetings, and selecting the pages to be read between sessions. “I don’t give

<p>Visualize it: _____</p>	<p>Write about it: _____</p>
<p>Estimate it: _____</p>	<p>Check it: _____</p>

**FIGURE 2** Conversation Roundtable in Mathematics

them assigned roles, such as ‘discussion director’ or ‘illustrator,’ as I find that these tend to inhibit the conversation. But I do teach them about the elements of argumentation in discourse and in writing, and they know this is an expectation of their discussions.”

Individual accountability comes in the form of the journal writing they conduct at the end of each session, as well as the literary criticism essay they write at the end of each reading. “It’s hard to suddenly sit down and write in a rhetorical fashion when you’ve had little experience at doing so in discussion. These literature circle meetings give them the practice they need to read literature with a critical eye.”

These same students regularly move through texts in other classes as well.

Their U.S. history teacher Lee Nguyen often requires his students to jigsaw (Aronson, Bridgeman, & Geffner, 1978) longer and more complex documents. “We just did this last week when we examined the U.S. Constitution in detail,” he remarked. “I can tell them what’s in it, but I really need them to dive into it in order to understand its elements and how they relate to the whole.”

By dividing the class into expert groups that included the preamble, Bill of Rights, and individual amendments, they could first discuss their assigned section in depth with fellow learners, then present the information to their home groups later.

Meanwhile, chemistry teacher Thomasina Jackson uses Reciprocal Teaching (Palincsar & Brown, 1984)

when her students read scientific articles. “They can get pretty complex, especially because they are often compact—an abstract, a short literature review, methods, findings, and discussion. And it’s usually in an article that’s only a few pages long.” Groups of four students read and discuss the article in chunks following this structure. “They need to make sure everyone understands it because they each write a précis about the article independently, with part of their grade derived from how well their group members do,” Ms. Jackson said.

### **Examples of Productive Group Work in Discussion**

Although the previous examples featured texts as the centerpiece, other routines foreground the discussion itself. Seventh grade pre-algebra teacher Kevin Collins uses a process called Numbered Heads Together (Kagan, 1994) when preparing students for tests. “I pose questions to them, like a game show, and then the groups discuss the answer. After I give the groups a few minutes,” he explained, “I tell them to make sure everyone in the group can answer the question and provide a sufficient rationale. I then draw a name, and if that person can do so, the entire table earns points!”

Sixth grade social studies teacher Sue Goodenough uses Walking Reviews (Frey, 2010) weekly to gauge her students’ understanding of the content she is teaching. “This is a great way for me to use many of the ancillary items that come with the textbook,” she said. Although much of the material was initially designed for independent use, she uses it collaboratively. “The students get their own copy of the worksheets, but instead of completing them on their own, they have to find someone else who can answer the question.”

Her students circulate around the room, writing answers on each other’s papers and signing their names to

the responses. “They answer the last question on their own, which gets them back in their seats, and I collect their work,” she said. “It gives me a good idea of who is getting it, and who isn’t.” She added that the true value is in the discussions that occur during the activity. “Sometimes they disagree, or don’t understand. That’s when I really listen, because I want to hear how they explain themselves and justify their answers.”

### **Examples of Productive Group Work With Resulting Products**

Some collaborative work should be designed to result in the production of written evidence of the interaction itself. Group tasks are often focused on the assignment, such as writing a lab report or completing a worksheet, with comparatively little attention to how the group got there.

But groups can gain insight into the behaviors that contributed to or inhibited their processes by examining the steps they took to complete the task. In addition, these processes provide further assessment information beyond the final product itself. Teachers sometimes feel a bit apprehensive about using productive group work because they are concerned that they cannot adequately assess the learning that occurred within the group. This leads them to confining their assessment to the social aspects of the group, often through student self-reports and peer evaluations (Frykedal & Chiriac, 2011).

One example of this is the Collaborative Poster, which requires each member to use a unique color of ink or marker. This allows the group (and the teacher) to quickly assess the contributions of each member. Patricia Gentry uses this instructional routine regularly with her seventh-grade social studies classes. “I’ve been doing this for several years now. When we’ve

## Setting the Stage for Meaningful Discussions

- ◆ *Planning for purposeful talk* by incorporating standards, establishing a clear purpose, and identifying learning, language, and social objectives for lessons;
- ◆ *Creating an environment that encourages academic discourse*, including the physical room arrangement, teaching the routines of talk, and scaffolding language;
- ◆ *Managing the academic discourse* through grouping and collaborative activities that increase confidence and provide students with ways to consolidate learning with their peers; and
- ◆ *Assessing language development* using practical tools for monitoring progress and identifying areas of need. (Fisher, Frey, & Rothenberg, 2008, p. 2)

got a small group discussion going on, students chart their work to report out to the rest of the class,” she told us. “Each student has a different colored marker and they sign their names so I know who’s who.”

More recently, she has adapted this to online collaborative documents. “The students were studying traditional Islamic and African cultures of the period from 1000–1500 CE. Each group developed a collaborative essay on a specific topic using an online document editor, and their reports featured different colored



fonts for each member.” Ms. Gentry continued, “Not only could I see their individual contributions to the end product, but they could gauge their own work as it developed. When you don’t see much of your own ink, you know you need to step it up.” She added, “It’s a great way for the groups to monitor their own work along the way and not have to wait until the end of the project to voice their concerns.”

English teacher Ken Ryu stresses the importance of Peer Response with his ninth-grade students. “I have always emphasized the importance of audience for their writing, whether it be narrative or expository,” he began. “When they start the school year, we begin with discussing the purposes for peer response, and how it’s different from peer editing.” Using a framework described by Simmons (2003), he teaches students about three categories of responses that are useful for their fellow writers:

1. *Playback the text* for the writer by briefly summarizing the main points as you understood them.
2. *Discuss the reader’s needs* by alerting the writer to confusions you had as you read the piece.

3. *Identify writer’s techniques* you noticed, such as the use of headings, examples, and direct quotes.

“Sometimes they do this face-to-face, but more often lately they do it within a digital environment,” Mr. Ryu said. “They insert comments into the margin and code their responses—PT, RN, and WT for the three types of responses I’ve taught them.” Mr. Ryu requires that each writer submit the final version of their paper and the marked-up text of their draft. “I get a good perspective on the writer and the reader,” he said. “Sometimes the reader makes a really insightful comment that I hadn’t even thought of.”

## Quality Indicators of Productive Group Work

The examples we have offered are not an exhaustive list, and no doubt you use many other instructional routines that are not listed in this article. Therefore, it is useful to have an internal method for gauging whether the productive group work is occurring. We call these quality indicators because it describes the salient features we look for in our own

classrooms, as well as those we visit as teacher-leaders (Frey, Fisher, & Everlove, 2009).

**Complexity of Task.** The first consideration is whether the task the students are engaged in is sufficiently complex so that it fosters their need to interact with one another in order to be successful. A group that divides a task and then assembles it in the final minutes probably had an assignment that was too easy for them. In addition, the task should be appropriate for the grade level and course, with opportunities for students to use resources, apply their knowledge in a variety of ways, and be exposed to the thinking of others.

### Joint Attention to Task or Materials.

It isn’t uncommon for the entire class to be engaged in small groups simultaneously, and since there’s only one of you, it means you sometimes have to judge a group’s processes from across the room. We look for the body language of interaction: joint visual attention on materials and one another, conversational turn-taking and such. When we see a student push her chair away from the group and fold her arms, we know to head over to the group to find out what is going on.

**Argumentation, Not Arguing.** A complex task means that students are going to struggle a bit, and how they move through difficulty is going to determine whether they are successful in completing the task. Using the principles of accountable talk (Michaels, O’Connor, & Resnick, 2007), students are taught that they have responsibilities to their learning community:

- ◆ “Stay on topic.
- ◆ Use information that is accurate and appropriate for the topic.
- ◆ Think deeply about what the partner has to say (Fisher & Frey, 2007, p. 23).”



These are necessary behaviors when asking questions, persuading others, exchanging information, and furnishing evidence. We listen for these types of interactions during their discussions, and even provide language supports when needed for some groups.

**Language Support.** These include a myriad of written, verbal, peer, and teacher supports that facilitate the conversation. We frequently use basic language frames on table tents so that students can refer to them as needed. For instance, one table tent we created for a particularly contentious group was called “5 Ways to Disagree without Being Disagreeable” and featured frames such as, “I think you have an important point, but \_\_\_\_\_” and “Although I agree with you about \_\_\_\_\_, I feel differently about \_\_\_\_\_.” In addition, we listen

for the language of the lesson: the academic language and vocabulary of the discipline. In a physics class, we expect to hear words like *momentum* and *velocity* as well as the rhetoric of science such as forwarding a hypothesis, examining data, and making observations.

**The Teacher’s Role.** Without question there are times when our roles during productive group work are focused on the logistics of the task, but our goal is always to reduce this in order to engage in active listening, teaching, and formative assessment. Productive group work is an ideal time to watch learning up close, listen for misconceptions, scaffold through guided instruction, and monitor progress. When we find ourselves spending more time doling out materials and less time teaching, we know the design of the task was not as well organized as it could be.

**Grouping.** In our experience, limiting the group’s size to five or less seems to work best. When the group gets to six, they often subdivide and end up conducting separate, sometimes parallel conversations. Keep in mind that the size of the table doesn’t need to dictate the group. One of our colleagues has tables of eight, but invariably has two groups of four at work.

## A Look Inside at Productive Group Work

“The secret is to give them something to talk about. There’s nothing adolescents like better than a good controversy,” says eighth-grade teacher Mr. Alvarez. He values the role of collaborative learning in developing critical thinking skills for use in reading and writing. He begins by distributing a Discussion Web (Alvermann, 1991) to foster meaningful conversation. This graphic organizer features a question in the center of the page: “Is the fast food industry

responsible for the super-sizing of Americans?” Although some students are eager to answer immediately, he reminds them to first write responses supporting both a “yes” and “no” position in the columns labeled on the discussion web. As they write he leans in to quietly assist Carmelita with spelling a word she is stuck on, then prompts Andrew to be sure to add items to the “no” side of his web.

After a few minutes, Mr. Alvarez opens the question for discussion. Greg offers that Americans are getting fatter and Carmelita concurs, citing a news report she heard on television a few nights earlier. Elizabeth takes a different tact, explaining that in her opinion, people are responsible for their own health and no one is making them eat more food. Luz mentions a news story she heard on the radio about a man suing McDonald’s because he was overweight.

“It sounds like we have some pretty strong opinions but need more facts. Let’s take a look at this reading for some more information,” instructs Mr. Alvarez. With that, he offers a reading outlining some of the issues surrounding this controversy. “I want you to read it for the purpose of collecting information both in support of the fast food industry’s position as well as nutritionists’. When you notice one, jot it down on your discussion web.”

As students read, Mr. Alvarez moves quietly around the table, occasionally asking a student to read aloud quietly so he can listen to them. He observes students making notes on the reading and the discussion web and watches for signs of completion. “Now we’ve got some more facts! Let’s try to answer that question again. Is the fast food industry responsible for the super-sizing of Americans?” asks Mr. Alvarez.

A lively debate ensues as students alternately condemn and defend the

## Planning Questions to Support Collaboration

- ◆ What task will I ask students to work on together?
- ◆ What talking, reading, and writing will students do?
- ◆ How will I group students? Why?
- ◆ How can I differentiate for those who need different levels of support?
- ◆ What language and vocabulary do I expect students to use?
- ◆ How will I facilitate students’ academic language?
- ◆ How will I make my expectations clear? (Fisher, Frey, & Rothenberg, 2008, p. 55)



fast food industry, citing facts from the reading. Mr. Alvarez returns to the discussion web one last time. "Please take a few minutes to review your notes. In the third section, add any points you heard during the discussion that you did not include originally." After the students have completed this task, he has one final set of instructions for them. "You've got the basis for a persuasive essay. Please use your notes to write one in support of either side of the issue. Remember to acknowledge the other position in your writing."

He adds, "I've also got some additional materials for you to consult. One excellent source is this book, *Fast Food Nation* (Schlosser, 2002). It will be in the independent reading section of the classroom if you'd like to choose it." With that, these learners return to their

desks, possessing the tools to write a compelling essay.

Mr. Alvarez smiles to himself as he hears the debates continuing even as the students begin to write. "Like I said, there's nothing they like better than a good controversy!"

## Conclusion

Collaborative learning is an umbrella term that involves students working together. Some of the tasks students complete are group work and others are productive group work. Both of them are appropriate at different times in a lesson. Having said that, it is important to recognize that productive group work, and the resulting individual accountability, provides the teacher

with information about students' understanding and what they need to learn next. As such, productive group work tasks need to be included for students as they consolidate their understanding of the content.

As students are increasingly required to engage in higher levels of collaboration that challenge them to resolve problems, they need experiences that make it possible for them to use the language of the disciplines they are learning. Whether preparing for career, college, or just the next grade level, students who regularly use evidence, justify claims, ask questions, and consider information are more prepared to do so independently. Therefore, productive group work doesn't have an endpoint; we use it every day of our lives.

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## Additional Resources From IRA

Vaca, J., Fisher, D., & Lapp, D. (2011). Designing and assessing productive group work in secondary schools. *Journal of Adolescent and Adult Literacy, 54*(5), 372–375.

In this article, the first author, a high school U.S. History teacher, describes how he increased individual accountability during extended productive group work during a unit on the development of the Social Security Act of 1935, and discusses his group and individual assessment processes.

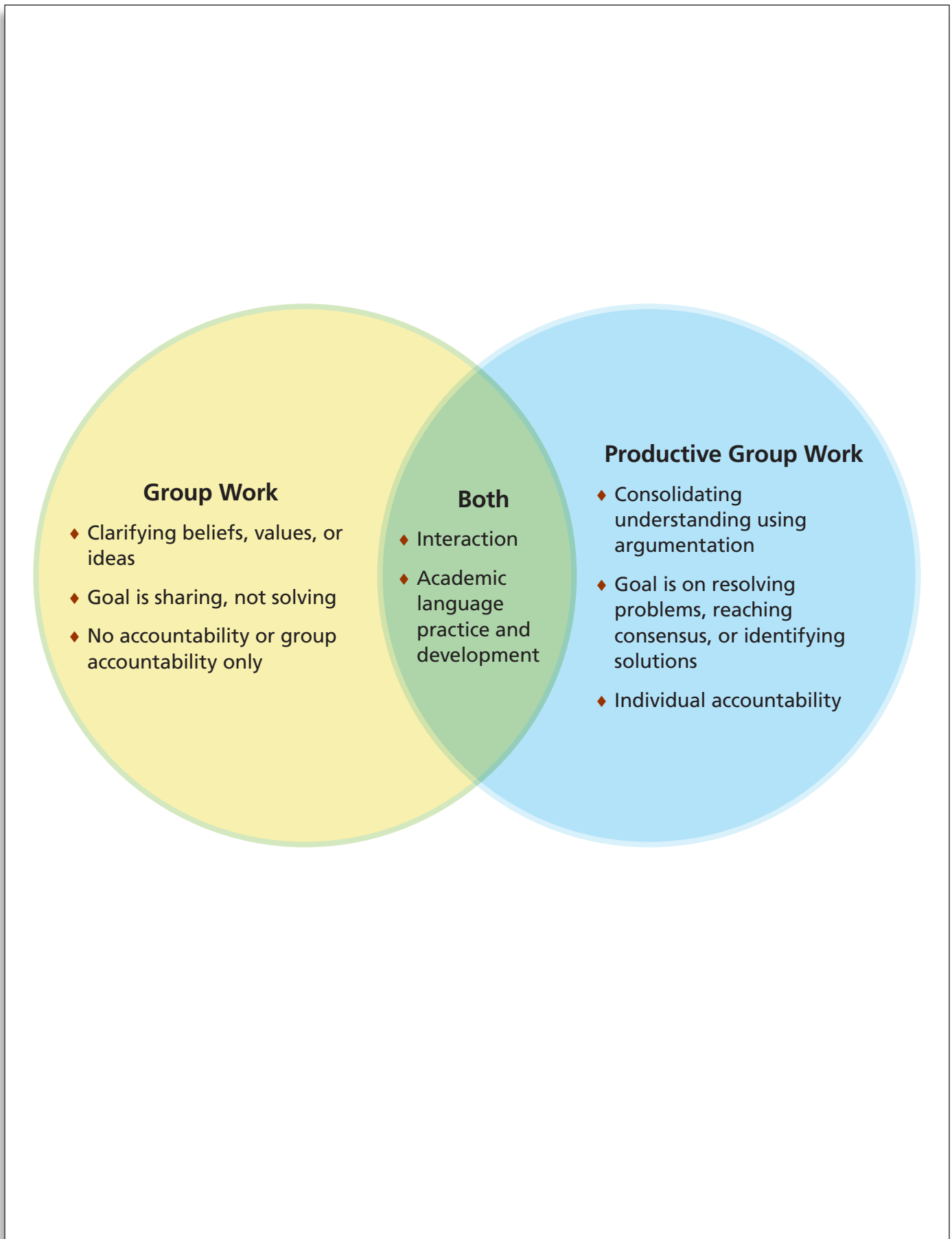
Wood, J.R. (2011). *Active reading through self-assessment: The student-made quiz*. Retrieved January 26, 2012, from [www.readwritethink.org/classroom-resources/lesson-plans/active-reading-through-self-30702.html](http://www.readwritethink.org/classroom-resources/lesson-plans/active-reading-through-self-30702.html)

The lesson description says it best:

*While reading often feels like a solitary activity, teachers can introduce active reading strategies that are social to help students better comprehend their reading. This recurring lesson encourages students to comprehend their reading through inquiry and collaboration. They work independently to choose quotations that exemplify the main idea of the text, come to a consensus about those quotations in collaborative groups, and then formulate "quiz" questions about their reading that other groups will answer. By the end of this lesson, students will have a better understanding of what to focus on in their reading and how to ask good questions. (Overview, n.p.)*

International Reading Association. (2009). *New literacies and 21st century technologies* [Position statement]. Retrieved January 26, 2012, from [www.reading.org/General/AboutIRA/PositionStatements/21stCenturyLiteracies.aspx](http://www.reading.org/General/AboutIRA/PositionStatements/21stCenturyLiteracies.aspx)

Meaningful collaboration in face-to-face and digital environments is essential for the worlds of learning and work. In this position statement, developed in 2009, IRA calls for the integration of information and communication technologies that build students' skills.

**FIGURE 1. Comparing and Contrasting Group Work and Productive Group Work**

**FIGURE 2. Conversion Roundtable in Mathematics**

Visualize it: _____	Write about it: _____
Estimate it: _____	Check it: _____