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Giving Students Meaningful Work

Making Group Work Productive

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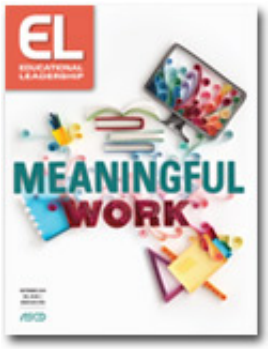

By paying attention to six important indicators, teachers can design group projects that consolidate and extend learning.

The students in Mr. Bonine's 10th grade biology classroom are immersed in the business of creating a new creature. Throughout the first semester, they've been studying habitats, natural selection, adaptation, anatomy, and physiology. In groups of three or four, they are now applying their knowledge to design a new animal that has the characteristics of either a mammal, a reptile, or an amphibian.

One group envisions a salamander that lives in salt water. "Let's talk about that," Mr. Bonine offers. "How will your salamander process the salt intake? Amphibians don't usually live in that environment." The group members look at one another in confusion but then begin to explore how they will solve the problem.

In another corner of the classroom, four students are creating a cell journal. They illustrate the structures of their creature's cheek, heart, sperm, and egg cells, using what they have learned from their study of anatomy and physiology. "Remember that sperm cells need flagella to move," Kristen reminds the group. Antonio adds, "Ours is a viviparous [live-bearing] mammal, so the structure of the egg is bigger and there are fewer of them." As the group members talk, Madalyn draws and labels the cells.

Mr. Bonine's Critter Project is a weeklong assignment in which students consolidate what they have learned during the semester, engaging collaboratively in productive group work to think, plan, and refine their skills (Frey, Fisher, & Everlove, 2009). Mr. Bonine has introduced this project at the optimum time in the instructional cycle. When students are ready to clarify and refine their growing understanding of what they've been learning, they need opportunities to interact purposefully with one another to complete meaningful learning tasks.

In observing Mr. Bonine's Critter Project, we see six indicators of productive group work:

1. Creative tasks.
2. Joint attention to the task.
3. Development of group social skills.
4. Language and organizational support.
5. Optimal group size and composition.
6. An active teacher role.

Creative Tasks

At their best, group tasks should require students to creatively apply the concepts and skills they have learned. The group should not simply replicate what the teacher has already modeled for them. Instead, students should have opportunities to experiment with the concepts under investigation.

Such experimentation opens up the possibility that the group might make mistakes and experience failure. Although we don't usually view failure as a goal, error-free learning is unlikely to result in robust

learning. Students need opportunities to try, fail, and then try again to construct new understanding. This *productive failure* (Kapur, 2008) can help shift the learners' attention to the knowledge and skills they need to succeed.

In Mr. Bonine's class, one group's initial attempt to devise an amphibian that lived in a saltwater environment failed. However, this initial failure focused the students' attention on gaps in their understanding of osmosis and ion exchange. Their initial unsuccessful attempt spurred them to review what they had learned and helped them refine their knowledge of a previously misunderstood concept. The group began to realize that their creature would need a fresh-water environment to survive and reproduce.

Joint Attention to the Task

When the entire class is engaged in productive group work, the teacher cannot be simultaneously present in each group. But the savvy teacher can recognize whether the work is productive or not, even from across the room. Joint attention to the task means that the group's body language and visual gaze are routinely fixed on the materials at hand. Students move in ways that suggest coordinated and purposeful effort. If a student sits physically apart from the group with arms crossed and eyes fixed elsewhere, the task is probably not meaningful for that student.

In addition, the teacher should listen for language exchanges that signal productivity. The conversation should be mostly on topic, and the discourse should include questions, personal opinions, and conclusive statements. Most important, the teacher should listen for comments that synthesize information from different knowledge bases and propel the group to refine its understanding, such as Antonio's remark on the nature of his group's mammal and the characteristics of its sex cells.

Development of Group Social Skills

Students in productive groups challenge one another as they strive to reach consensus, but they don't argue. They have learned how to disagree with one another in a civil way, provide evidence to persuade others, offer opinions, and change them in response to others' input.

To make such dialogue possible, teachers often establish group social norms—for example, sharing successes and failures, making decisions collaboratively, and taking turns. Sometimes it's helpful to provide language frames that students can use to support their conversations (see fig. 1). [LINK TO PDF OF FIGURE 1.]

Mr. Bonine has found that conflict management is an especially important skill to teach his class. In previous years, he had seen groups sometimes dissolve into individual work when members couldn't reach consensus about how to approach a challenging task. Since the beginning of the year, he has modeled and thought aloud on six steps toward resolving a disagreement in the group:

- Listen to the views of others.
- Avoid hurtful statements about others.
- State your own view without becoming defensive.
- Identify personal concerns and acknowledge the concerns of others.
- Accept the group's decision graciously.
- Resume the task.

For example, earlier in the year, he enlisted two other teachers to join him in performing several short

skits in which they acted out unproductive group behaviors. Next, they distributed the scripts for students to rewrite in more positive ways. The teachers performed the improved dialogues incorporating the students' suggestions and then led a discussion about the helpful and destructive behaviors they had enacted. The students were amused by the teachers' bad behavior in the first scenes, but they also saw how simple it was to turn a difficult situation into a productive one.

"I think this is one of the most important life skills I can teach them," Mr. Bonine says. "They're young adults who will need to work within groups all the time in college or on the job. I'm teaching them more than biology. I'm also teaching them how to work with others."

Language and Organizational Support

To promote productive group work, teachers need to provide visual and verbal support for the purpose of the work, rhetorical language structures, and academic vocabulary related to the task. Mr. Bonine routinely posts his purposes on the whiteboard. For the Critter Project, the purpose statement includes, "Use what you know about natural selection, adaptation, cellular biology, and an organism's interaction with the environment to design a new creature."

Mr. Bonine draws the students' attention each day to the vocabulary they will need—for example, reminding them that the text of their cell journals should include the terms *homeostasis*, *organelles*, and *tissue*. He provides sentence frames so that students can use more sophisticated rhetorical structures in their written work.

Additional organizational structures help students focus on their work. For example, the teacher color codes the task sheets for each day of the project so that students can find their work more easily. "If they're missing something," he explains, "I can tell them to look for the green paper, which seems to help them stay organized." In addition, Mr. Bonine posts a daily schedule with suggested times next to each task, and he displays a timer that shows the elapsed time.

Optimal Group Size and Composition

In our experience, a group size of two to five students is most effective in promoting meaningful interaction. Groups don't all have to be the same size, however. Some students work better in larger or smaller groups, and groups of varying size can often accomplish the same task.

Teachers should construct groups carefully to make the most of group members' strengths without magnifying areas of need. Groups should be heterogeneous to prevent a concentration of resources in any one group (except in cases when a homogeneous group is assembled for a specific purpose, such as reteaching a concept some students found difficult the first time).

Mr. Bonine used previous test scores to construct groups whose individual members represented different levels of knowledge of the various topics. For example, Madalyn had a good grasp of cellular structures and was an asset to her group when they developed the cell journal; Kristen, another member of the group, had done well on the adaptation unit. The group's imaginary creature, a large bird with a bony crest across the top of its skull, developed this trait because of the propensity of its males to fight during mating season. Kristen was able to clarify the role of secondary sexual characteristics of male animals for the rest of her group as they wrote their report.

An Active Teacher Role

Teachers play a crucial role in supporting, facilitating, and guiding productive group work. Although teachers need to manage the learning environment—including noise level, student movement, and

material distribution—that's not enough. They also need to monitor and adjust the other quality indicators. Are students interacting in meaningful ways, as shown by their verbal interactions? Do you see joint attention to tasks and materials?

In addition to assessing the progress of the groups, the teacher uses this time to deliver small-group guided instruction as needed. Mr. Bonine did this when he met with the students who were trying to create a saltwater salamander. He checked for understanding by asking questions about the cell structures needed to process increased salt and decreased levels of oxygen. Then he helped students retrieve their background knowledge of the cellular processes involved in osmosis by referring them to a classroom poster illustrating the process of ion exchange. When he saw that they needed even more instruction, Mr. Bonine provided a few minutes of direct explanation on why amphibians are scarce in saltwater environments. The supports he offered gave the group the information it needed to repair and revise its project, thus turning productive failure into productive success.

A Place in the Instructional Cycle

Productive group work occurs when teachers build the knowledge and skills students need to participate in group tasks. Such teachers develop students' content knowledge by delivering focus lessons, providing guided small-group instruction, and designing independent learning tasks to promote mastery. Collaborative learning opportunities fit into this instructional cycle at the point when students are ready to strengthen and extend their new knowledge through group interactions with their peers.

Consolidating understanding, using academic language, and enjoying learning—that's what school should be about.

References

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