

# Helping Students Do Well in Class: GAMES

October 01, 2006

*I studied so hard for this test, and I still did badly! What can I do?* I know that a few students are going to appear at my door with this lament after I return exams each semester. I am usually as distressed by their performance as they are, and often at a loss to offer sage advice on what they can do differently. Over the years I've tried to help students apply what they are learning in my psychology of learning class to their own behavior and I've found a fairly successful mnemonic for studying — GAMES — that conveys much of what we know about learning. I share it with my students at the beginning of every course so they will apply it, but also as an example of what they will be studying. For some reason, however, until recently I never thought to apply it to myself as a way of helping the students I teach and advise. This column reviews GAMES and its relevance for both students and instructors.

## GAMES

The letters of this mnemonic stand for my best advice to students as they study. Each letter is supported in the theory and literature.

**G** Goal-oriented study

**A** Active study

**M** Meaningful and memorable study

**E** Explaining to someone as a study strategy

**S** Self-monitoring during study

Teachers can increase students' performance by applying what we know about effective learning to their own behavior and using these findings to support student studying. A sample handout that you can give to your students is shown in Appendix A.

## Goal-Oriented Studying

Having a goal when you study is much more efficient and effective than just sitting down and reading. When I ask about students' study goals, they usually mention time spent or pages reviewed ("I'm going to study for two hours." "I'm going to finish chapter two."). While such goals are better than nothing, they don't match what we know about learning. Spending time or simply completing assignments is not the real course goal, students need to understand the concepts. Do students actually mean the same thing that we mean when we say "understanding?" I don't think so; I would speculate that even we instructors don't always mean the same thing by "understanding." That was one of the reasons behaviorists were originally loathe to phrase instructional objectives in terms of understanding; they pushed for a clearer

specification of actual behavior.

Here is where instructors can be most helpful to students. We want them to set “understanding” goals for their studying, so we should help them recognize what that means in this context. For example, when I say I want students to understand how theory informs practice in psychology, I mean that I want them to be able to explain a theory in everyday language, recognize examples of its application, suggest examples of its application to their own actions as practitioners, and possibly even provide arguments for and against using a theory as a basis for practice in alternative application settings. Those goals serve as clear checkpoints that students can use to measure their understanding of the theories. When they study, I would expect them to keep working at it until they can do those things with a given theory. They will not be able to do that just by reading. Good goals require that students make connections between what they are learning and what they already know, a key concept in learning, and between what they are learning and how they intend to use that learning in the future, an important foundation for transfer. So now when students come to me for advice I can suggest that they make similar concrete goals, and I can model what that might mean in behavioral terms.

The G of GAMES reminds me that setting clear goals for a unit or an activity helps students. Why are we practicing this stuff in this way? Helping them understand the answer will both make what we do more productive from a learning standpoint and serve as a good model of strategic learning for them. In class I should share my goals for each activity. In addition, I should verbally and openly model the process of goal setting so that in a type of cognitive apprenticeship, students can see how a skilled learner approaches setting goals.

### **Active Study**

In office consultations about study strategies, students often proudly tell me that they spend a lot of time retyping their lecture notes, and then read them over until they know them by heart. That kind of activity may be all right if the goal of studying is to memorize information or to form simple stimulus response bonds, but unless exam items consist of the exact same words and examples as their notes, memorizing is not good preparation.

A big difference exists between “being active” and “active learning.” Copying notes and reviewing text are not activities directed toward learning. The productive activities suggested by the research on learning and memory (Alexander & Murphy, 1998; Bransford, Brown & Cocking, 1999) involve the “deep processing” of ideas. Activities that encourage surface processing, such as memorizing lists, recopying notes, practicing with flash cards, and other repetitious activities will not result in flexible use of information. Students have to engage in activities that transform the information into something that emphasizes structure and connections, key features, and paradigmatic examples.

**Annotated notes.** It is hard to convince students to abandon old strategies for totally new, untried ones, so suggest slight modifications to their study habits; rather than simply recopying notes, recommend that students annotate their notes as they recopy them. For example, they can create two columns, one with the recopied notes and one that highlights main ideas, turns statements into questions, lists key vocabulary, and maybe even identifies ways that the instructor might ask a question about that material. Figure 1 shows an example of “transformed notes.”

Granted, this type of studying activity is more complex and time-consuming initially, but it results in a deeper understanding. A less intense strategy is to reorganize notes rather than just recopy them. The goal is not simply for students to have well-organized notes (which they could get by borrowing someone else's), but for them to create their own organization and cues.

**Reading the text.** Active learning also can be applied to reading the text. A good strategy for students is to pause periodically and summarize what they just read. These paraphrases can form the bases for flashcards. The key is that students do more than read quickly through an assignment; they need to take some time to work with the ideas. Sometimes it is sufficient to take notes or write questions in the margins of the text; many students feel that highlighting the text is an effective strategy. But if these things are done mindlessly, they are no better than straight reading. If, however, students highlight a sentence and then ask themselves why they chose that sentence to highlight, they will take highlighting to a deeper, more active level.

**Flashcards.** Similarly, students will get a lot out of creating flashcards if they do more than simply copy what is in their book or notes. The act of selecting information to put on a card is a form of deeper processing. Teachers can encourage students to think about why some ideas deserve a separate card and some do not. Mindfully selecting discriminating features to include on flashcards is a form of deeper processing.

### **Meaningful and Memorable Study**

Research (Alexander, 2000; American Psychological Association, 1995) shows that during learning students make connections between new and existing information, major and minor points in a concept, abstractions and concrete examples, and especially between general and personally specific references. Learners create a unique, structural understanding of what they are learning in which the relationships among components and to the learners themselves are clarified. This happens naturally as we try to think of examples from our own experiences to understand a new idea.

We can model the process of making connections as we present the course material. Students often learn the examples we give first, and then use them to recall the principles they represent. We also can point out examples in the textbook so they will not be skipped in favor of *the main idea*. We can help students understand how important examples are for turning abstract ideas into concrete representations, which are generally much easier to understand and remember. Most of all we can encourage and even require students to create their own examples by asking for them during class and basing homework assignments on them.

**Structural understanding.** We model structural understanding when we provide outlines for lectures or charts and diagrams for ideas. In my classes I use a lot of comparative organizers (Figure 2). This type of chart is designed to emphasize the analytical process I am using to compare ideas or organize information. The analytical process involves determining what the contingencies are and what procedure is being described by each set of contingencies. As we learn about a given topic, we place it in the chart in relationship to the other most common contingencies. I sometimes give the students partially completed charts and have them attempt to fill in the empty cells based on their readings. We use them so often that students have reported beginning to think in terms of comparative organizers and to use them during studying, which is precisely what I want them to do.

## **Explaining to Someone as a Study Strategy**

The old saying “to teach is to learn twice” reflects the idea that it is not until you try to explain something to someone else that you really understand it yourself. No matter how prepared you thought you were, it requires a whole other order of magnitude of understanding to clearly communicate an idea to another person. A good study strategy is to find a partner and then explain ideas to one another. Better yet, students should try to find a willing listener who is not in the class and try to explain the main ideas to that person. I would settle for trying to explain the ideas to a dog. The act of saying the words out loud is what makes a difference here. I cannot provide any research data for my hypothesis, however.

It is a rare friend who is willing to sit through explanation after explanation, so students will probably have to save the live practice until test time. However, as a temporary substitute students can write summaries and paraphrases of ideas as if they were writing a letter home and trying to justify paying all that tuition by showing how much they learned.

***The principle of understanding.*** As instructors, the principle of explaining to understand is embodied in our use of group work in class. It takes a while to overcome student reluctance to engage in group work, but if it is a regular part of class, they eventually find that comparing their ideas helps them follow what is going on. In my classes, a major part of each class period is spent applying concepts to real scenarios in groups of three that remain the same throughout the semester. I create groups of students who have majors in common so they can apply the concepts to their fields of interest. I don't have to think up examples from widely divergent fields; the students do it themselves. I check over written documentation of their discussions, but in reality we have already checked their work since we discuss their ideas after each exercise. The discussion is the important thing.

## **Self-Monitoring During Study**

Our students really struggle with self-monitoring. Students often suffer from the “illusion of understanding,” that feeling that it was all so clear when someone explained it, but when you try to do it yourself, you can't (Bransford, Brown, and Cocking, 1999). When students watch us solve problems or describe concepts in class or read the text, they think they understand. But when they attempt to use information or solve problems, they realize they do not. That is why it is important for students to attempt to apply the concepts while studying.

Of course, students are not experts at monitoring themselves. They can easily get into the habit of only asking themselves questions to which they think they know the answers. Our task as instructors is to model what it means to monitor understanding. In fact, all the foregoing letters of GAMES provide strategies that students can use to improve their self-monitoring. As we incorporate these activities we can help students see how taking the kinds of actions we do in class and making them a part of the way they study will make them better learners. If they set good goals, they will have a better basis for self-monitoring. If they are active in their studying, the results of that activity will be good feedback on understanding. As they try to make connections between the content and their prior knowledge or future uses, they will be checking whether or not they have interpreted the content correctly. Finally, when they try to explain what they know, they see where they need to shore up their understanding. Unless they recognize the need for acting on all this feedback, they will not reap the full benefits of the GAMES system. Self-monitoring is the final brushstroke that completes the picture.

## **Conclusion**

This is the system that works with my students. I try to incorporate as many of these components into my day-to-day class planning as I can in the hope that seeing me use them will convince students of their value. I certainly use the GAMES structure to help students whose test performance did not meet their expectations. Whether they carry through with the suggestions or not is up to them, but as I frequently say, to the groans of the students, “Let the GAMES begin.”