

Learning, Motivation and Student Self-regulation

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Because it would be impossible to tell you everything that learning and motivation research has to offer the college level instructor, I've chosen to address primarily the intersection point of most of the research, which is the area of student self-regulated learning. This particular topic encompasses issues of both learning and motivation and is one near and dear to the hearts of faculty of all disciplines. All of us have felt the push and pull of trying to find the correct balance of support and independence that will help our students succeed at learning the content but also become independent of us as teachers.

The literature on self-regulated learning draws from research on content and skill learning as well as on the regulation of motivation and volition (reference?). For both of these areas the dominant psychological model today is the cognitive model of learning.

The basic premises of this model are the following:

1. The process of learning involves modifying incoming information so that it can be connected to the learner's existing world view in long term memory or modifying the world view to accommodate new information.
2. The learner can be actively involved in the above process at many levels. The deeper and more actively the learner deals with new information, the better the learning, the longer the retention, and the higher the probability of transfer to future uses of the information.

3. There are executive functions for both learning and motivation that the learner controls more or less effectively. The more mindful the control, the better the learning.

A self-regulating learner is capable of monitoring and modifying the strategies that he or she uses to learn new information and the strategies that motivate and maintain that motivation in the face of obstacles. It is this process of monitoring and modifying that I think holds the most promise for us as teachers to help our students move toward being self-regulated learners. What I'd like to do in this presentation is describe how I help my students become more aware of their own learning and motivation, and through that awareness begin the process of gaining control over it. Although I'm talking about students in psychology, the research data would support their use with some modifications in all disciplines.

GAMES – a model for self-regulation in studying

Like you, I have students who are too often narrowly focused on goals that seem to revolve around getting the best “bang for the buck” in terms of studying. They wish to expend the least effort that will ensure a level of adequacy in learning they can accept. This is not the motivational level I'd like to see them adopt, however, I know that I would do (and did) the same thing in their position. So I appeal to this motive when I introduce my own students to the GAMES model for efficient studying. I tell them that based on the research literature, if they will follow these five simple ideas, they'll get a lot better payoff from the same amount of time spent studying. And if they add to that an increase amount of time in study, they'll all be A students (possibly an exaggeration). I even have created a short survey describing various study strategies and have them rate the degree

to which they use those variations on the strategies in their studying as a diagnostic. Here is what each letter represents and the learning or motivation theory behind it.

G stands for Goal-oriented study

The literature on learning supports the idea that if learners begin with a fairly well-specified goal for understanding in mind, they have a higher probability of achieving that goal than if they just “study” generically. Certainly this is true for most tasks, including complex engineering projects. The reasons behind this rather mundane assertion are many, but remember that we’re trying to appeal to the students’ desire to spend the least amount of time for the most payoff. So I assert that by having a goal in mind you use your time efficiently. Here are some reasons.

- You can immediately narrow the field of options you have to decide amongst because you can eliminate any that would not lead to progress toward that goal.
- You can have available only those tools you’ll really need, thus making start-up time less onerous.
- You can tell how close to completion you are because you know what completion looks like.
- You can tell when you’re done because you’ve reached the specified goal.
- By keeping the goal in mind, your progress toward that goal serves to keep you motivated in the face of obstacles.

A stands for Active Study

Active study has a very particular meaning in the learning literature. The active refers to the learner’s behavior during learning and it refers to the active processing of

information rather than the passive receipt of information in predigested form from another. Simply doing something is not being active. For example, I can certainly read prose, but despite the fact that I'm engaged in an activity I'm not necessarily being an active learner. Active reading involves questioning the text and myself, noting where I can connect the text to my own experiences, looking for discrepancies or things that are unclear, putting the ideas in my own words, summarizing, and so on. On the other hand, I can listen to a lecture and appear to be very inactive, and yet internally I am processing what the lecturer says and digesting it, writing down my version of it or questions that I have about it. Simply writing down the lecturer's words verbatim would definitely not be active learning. There has to be some transformation of what is said or heard into something that connects with the learner's prior understandings.

M stands for making meaning and memories

One particularly good form of active learning is to make the new information meaningful or memorable for the individual learner. The process of learning involves reorganizing the learner's long term memory so that the new information being learned can fit into it and be retrieved in the future. Each individual's long term memory is unique and it is impossible for a teacher to make all the connections that would be meaningful for all the learners in a class. The best connections are those that the learners make for themselves. The learners do this by creating summaries, paraphrases, examples, and images that tap their unique collection of long term memory contents. Another very effective strategy in this area is to create structural summaries (like outlines, concept maps, comparative organizers) that have both a content and a visual component. The

visual component often can help the learners reconstruct all the content because visually stored information is very efficient and memorable.

In fact this use of visualization over and above its association with structure is one that is valuable by itself. If learners can create vivid images incorporating the details to be learned, the visual can serve as a storage medium in long term memory. Memory courses teach this as a way of remembering names: associate the name with some visual that combines the name and the person's appearance. This type of visual is particularly useful when the information to be learned has no inherent structure or logic and must simply be memorized. The visual image provides the "logic" or "structure" for storage. Visual images can also contain a lot of information in a very compact memory that can be accessed as a whole without having to search sequentially for what is present.

E stands for explaining to someone else to remember

Everyone who has ever taught is familiar with this phenomenon of learning. The process of trying to explain your ideas to another person is often the best way to learn them in the first place. Research has shown that learners can fool themselves into thinking that they understand a concept when they seem to run through it in their own heads. When these same learners attempt to verbalize the concept to another person, they find the words and ideas don't come so smoothly. Therefore, to really learn something or to at least find out if it is really understood, attempting to articulate the idea for another person is a very good strategy. In fact, it really isn't necessary to have a second person present (although that is ideal because you get their feedback); it is possible that one of the benefits of writing out the summaries and paraphrases mentioned earlier is that it

forces the learner to articulate his or her understanding of the concepts outside personal reflections. The written page then becomes the “other” to whom the learners are explaining their understanding. In the process of writing out that explanation, the learners find out whether or not they can articulate it smoothly as opposed to struggling for words and phrases to represent what they are thinking.

This benefit of explaining to understand may be one of the powers behind the success of small group work in facilitating learning. As students work in groups, they are forced to articulate their thinking and in the process realize whether or not it is solidified. They also receive the feedback that is so important to efficient learning. Before a misconception can become a solid memory, it is subject to reformulation in response to feedback and discussion. The final version that gets stored is a much richer and accurate version than the initial one proposed by the learner.

S stands for self-monitoring

This aspect of learning is key for self-regulation. In this process the learners should be regularly monitoring their own learning for goal achievement, accuracy, efficiency and effectiveness. To do this learners should return to the goals with which they started their studying to assess the extent to which those goals have been achieved. At the same time the learners should be evaluating the effectiveness of the strategies they have been using to reach those goals. A truly strategic learner keeps track of what strategies work when and stores this information for future use. It is quite obvious that not all study strategies are appropriate for all types of content or skills, and yet many students have only one strategy and they use it regardless of how effective it is. This may be partly because they define successful learning as whatever behavioral result they get

from that particular strategy. For example, my own students are wedded to the use of flash cards as a study strategy, and from this they seem to think that recognizing a term and being able to recite its definition constitutes understanding. I have to strive mightily to get them to think differently about what learning means. They never take the time to assess whether or not the strategy is the most efficient way to achieve their current goals.

To be efficient self-monitors, learners need to be asking themselves questions as they study. They also need to be aware of their physical and mental states and intervene to make sure they aren't losing efficiency because they're tired or distracted or frustrated. Of course, this also implies that they have strategies to use as alternatives or to use to overcome those barriers to efficiency. One big contribution that instructors can make to student learning is to help them identify alternative strategies for learning the content of the specific course. Such advice from the instructor is held in far more esteem than that from any general study strategies book.

Which brings me to....

What does this all mean for your students? As I said earlier the GAMES model is one that is useful as a general strategy for self-regulation of studying, but particularly useful for my psychology students. However, there is much research in learning that supports the importance of disciplinary differences in learning that need to be considered. Therefore, I'd like to invite you to think about the components of effective studying that would be appropriate for your discipline. I know, for example, that in courses with a mathematical basis, an important study behavior involves working through the sample problems in the book. As a psychology major, I had to take a lot of statistics courses, and I found them very difficult. It was only later that I realized that I was using the wrong

strategy for learning statistics. I had been focusing on the prose part of the text, the descriptions of the statistical tests, and skipping over the problem solutions. My strategies that were very efficient for most psychology texts were inappropriate for the content of a statistics text. Now, it's possible that all your students are already well versed in the strategies for making meaning in your content area. But do you know that for a fact? If you don't know that, how can you find that out? Might it be useful to concoct something like my GAMES acronym for your students and have it represent the study strategies that are appropriate for the course content? I think so obviously or I wouldn't have asked the question.

So I would like you to think a bit right now about what strategies do you envision your students using when they study for your course. Then compare your ideas with someone else in the room, possibly someone teaching in a similar area. Are the strategies that you come up with things that it would be worth evaluating for your students and then suggesting new approaches to those that they don't use? If you create some general categories (like the GAMES categories) and then some examples under each category, you can create a diagnostic instrument like mine that you can use as a teaching device for your own students. Let me give you some time to think and share and then we'll discuss as a large group what the implications of these ideas are for engineering students.