



INNOVATION ABSTRACTS

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Setting the Standards for Student Behavior

Students might be more enthusiastic about engaging in active learning techniques if they could realize some personal, as well as pedagogical, benefit. Having stumbled onto this astounding revelation—that grades *do* interest students—I decided to allow students to determine a portion of their final grade through self-assessment.

The strategy is simple. Each semester, during the initial class meeting, students form groups (three to five members each) to determine criteria by which they should be evaluated as students. Each group shares its list with the entire class, one criterion at a time. At the end of this process, and after I have recorded the criteria on the board as the groups reported, I announce that I will combine their list with those from my other classes and distribute a master list. I then remind them that they will write a self-assessment at the end of the semester and assign themselves a numerical score.

My students developed the following list of student behaviors during the spring 1996 semester: attend class; be punctual; be prepared; pay attention; take notes; follow instructions; study; do assignments; participate; ask questions/seek guidance; set goals/work toward goals; be committed; be organized; be positive (have a good attitude); work to full potential/take pride in your work; be open minded; be creative; be considerate of others; help others/share/network; be considerate of the equipment/facilities; challenge the instructor; have fun; learn; and be honest.

The only criterion that needs some explanation is *challenge the instructor*. It has been on almost every list since I began this process; students appreciate the stimulating spirit of this item. It is not meant to be an "in your face" challenge, but a constructive and beneficial behavior for both the instructor and students.

Students benefit from this aspect of active learning on many levels. They make a significant and positive contribution to the structure of the course on the first

day of class. They are positive about the rules of the class because they created the standards. On those rare occasions when the class has to be stimulated to participate or dissuaded from side discussions, I only remind them that *they* developed the list. I believe students participate more in class activities and discussions because they understand it is what they are supposed to do and because they know they are in a safe environment.

The students' job is not easy, as is evident from the length and magnitude of the items on the list. From time to time, I casually ask about their level of awareness of their roles and responsibilities, a gentle reminder that they should be conscious of their contributions and commitment to the success of the class.

At the end of the semester, students write a one-page description of how they fulfilled their responsibilities. They also assign themselves a numerical score, which I add to their total points for the course. Students have always exhibited thoughtfulness, introspection, and creativity in their self-assessments.

However, some students are more critical of their achievements than they should be. When students are so self-critical that their self-score will lower their final grade, I intervene to the extent that their assessment is not a serious detriment.

The students are not the only beneficiaries of this process. I have found my classes more enjoyable and easier to teach, the students more attentive and responsive, and the atmosphere more relaxed and open.

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Games for the Mathematics Classroom

Games, especially variations of popular game shows and board games, can generate student interest and enthusiasm in the classroom, build self-esteem, and increase self-confidence.

Concentration is based on the children's memory game. Individual cards, numbered 1-20 (the number of cards used for each game may vary), are arranged on a large poster board. The class is divided into two teams. A monitor turns the cards, revealing a problem or solution. If the cards represent a "match," the team takes another turn. (A "match" can be a problem and its solution or an English phrase translated into math. For example, a card labeled "Twice the sum of 'x' and 'y'" would match the card labeled " $2(x+y)$." If the first team does not produce a match, then the other takes a turn. From this point, the players choose one card at a time and try to remember where they have seen the matching card. This game generates excitement and enthusiasm, especially when a team's "match" is challenged.

Jeopardy is based on the TV game show. A game board displays mathematical categories and points. The class is divided into three teams, and each team is given a call bell. The first team selects a category and point amount; a card is turned revealing a question or problem. The first team to ring the bell answers. If the answer is correct, the team gets the indicated point amount; if incorrect, the amount is deducted from their score.

Wheel of Math is based on the TV game show, "Wheel of Fortune." A large spinner is divided into 16 sections, each labeled with mathematical topics and points. The first team selects a member to spin the wheel. If the spinner lands on Quadratic Equations for 700, for example, then the team would have to answer a question or solve a problem dealing with quadratic equations. If the answer is correct, the team has a chance to choose a letter which ultimately spells out a mathematical phrase or a motivational message.

Mathematical Pyramid is based on the TV game show, "\$25,000 Pyramid." It helps students increase their understanding of key mathematical concepts and terminology as they describe these concepts in their own words. The game board consists of six pyramid-shaped cards labeled with mathematical categories. (A sample category is "A Picture Is Worth a Thousand Words." If a student selects this category, then he/she would have to describe these things associated with graphing functions: domain, intercepts, vertex, range, axis of symmetry, asymptote, and ordered pair.) The

class is divided into two teams. The first team picks a category and selects two players. The two players on this team decide who will give the clues and who will receive them. Once this is decided, the student giving the clues has 30 seconds (more time may be given if desired) to describe seven mathematical terms or concepts to his partner. The team is then awarded points, depending on the number of terms identified correctly. Then, the next team chooses from the five remaining categories and proceeds in a similar fashion. The team with the most points wins.

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All of these games can be adapted for any level math course and used in other disciplines, as well. They may be used as a review before a test or for a change of pace during a regular class period. Taking 20 minutes to play a quick game of "Jeopardy," for example, helps reinforce important concepts and gets the students involved.

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