

**Improving Student Achievement Using
Robert Marzano's *The Art and Science of Teaching* (2007)**

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I. Key Research Conclusions from Robert Marzano (*The Art and Science of Teaching*):

- ❑ Teachers can make an enormous difference in promoting the academic success of all learners.
- ❑ Three components are necessary for effective classroom pedagogy: (a) sustained use of research-based effective instructional strategies; (b) ongoing use of effective management strategies to promote a true community of learning within the classroom; and (c) use of effective classroom curriculum design strategies.
- ❑ Students should clearly understand the purpose of what they are learning and why they are learning it.
- ❑ Students should track their own progress and assess how they are progressing toward proficiency and advanced competence relative to clearly-articulated learning goals.
- ❑ Effective teaching and learning requires that students move toward conceptual understanding and independent transfer/application of key knowledge and skills.
- ❑ Effective classrooms are collaborative partnerships and true communities of learning.

II. The Art and Science of Teaching “at a Glance”: Key Instructional Design Questions:

- ❑ Question 1: What will I do to establish and communicate learning goals, track student progress, and celebrate success?
- ❑ Question 2: What will I do to help students effectively interact with new knowledge?
- ❑ Question 3: What will I do to help students practice and deepen their understanding of new knowledge?
- ❑ Question 4: What will I do to help students generate and test hypotheses about new knowledge?
- ❑ Question 5: What will I do to engage students?

- ❑ Question 6: What will I do to establish or maintain classroom rules and procedures?
- ❑ Question 7: What will I do to recognize and acknowledge adherence and lack of adherence to classroom rules and procedures?
- ❑ Question 8: What will I do to establish and maintain effective relationships with students?
- ❑ Question 9: What will I do to communicate high expectations for all students?
- ❑ Question 10: What will I do to develop effective lessons organized into a cohesive unit?

Initial Reactions, Reflections, Questions:

I strongly agree with the following research conclusions identified in Part I:

I have questions about the following research conclusions identified in Part I:

I am especially interested in learning more about the following instructional design questions presented in Part II:

III. Research-Based Action Steps and Related Strategies Proven Effective in Promoting High Levels of Student Achievement:

A & S Design Question 1: What will I do to establish and communicate learning goals, track student progress, and celebrate success?

- ❑ For learning to be effective, clear targets in terms of information and skills must be established and understood by the learner.
- ❑ Students should be actively involved in tracking their own progress in relationship to these learning goals/targets.
- ❑ Student engagement and ownership of the learning process increases when they are given opportunities to celebrate their successes in relationship to mastery of identified learning goals.
- ❑ This design question addresses the research-based conclusion that formative assessment is a critically important way for students to acquire and integrate new knowledge and to make adjustments as they move toward conceptual understanding and independent transfer: i.e., students need ongoing feedback so that they can adjust and improve their use of knowledge, skills, and understandings in relationship to performance targets and evaluation criteria.
- ❑ Marzano emphasizes the research-based distinctions of extrinsic motivation (i.e., some tangible token or payment for success) vs. intrinsic motivation (i.e., behaviors for which there is no apparent award except the activity itself). Marzano concludes that “positive effects are reported when the measure of intrinsic motivation is students’ interest.” The more a student is intrinsically motivated, the greater the likelihood they will retain what they are learning and use it with growing levels of conceptual understanding and transfer.

Action Step 1: Make a distinction between learning goals and learning activities or assignments.

- ❑ A learning goal is a statement of what students will know or be able to do; an activity describes things students do as a means to accomplishing stated learning goals.

Action Step 2: Write a rubric or scale for each learning goal.

- ❑ Marzano recommends a maximum of 20 measurement topics per course or grade level subject.
- ❑ He suggests that students and their instructor build consensus about levels of performance for each learning goal using a scale: (a) Score 4.0: In addition to 3.0, student demonstrates in-depth inferences and applications that go beyond what was taught; (b) Score 3.0: No major errors or omissions regarding any of the information and/or processes (simple or complex) that were explicitly taught; (c) Score 2.0: No major errors or omissions regarding the simpler details and processes but major errors or omissions regarding the more complex ideas and processes; (d) Score 1.0: With help, a partial understanding of some of the simpler details and processes and some of the more complex ideas and processes; (e) Score 0.0: Even with help, no understanding or skill demonstrated.

Action Step 3: Have students identify their own learning goals.

- ❑ Ask students to identify something that interests them beyond the teacher-identified learning goals.

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- ❑ When students have identified their personal goals, they should write them in a format similar to the one used by the teacher. For example: (1) When this unit is completed, I will better understand _____. (2) Students might use a simplified scale to keep track of their progress: 4=I did better than I thought I would do; 3=I accomplished my goal. 2=I didn't accomplish everything I wanted to, but I learned quite a bit. 1=I tried but didn't really learn much. 0=I didn't really try to accomplish my goal.

Action Step 4: Assess students using a formative approach.

- ❑ Instructor designs assessment items and tasks that apply to levels 2.0, 3.0, and 4.0.
- ❑ Students are given feedback (based upon their patterns of response as measured by the scale/rubric).
- ❑ Effective formative assessment ensures that students understand how they are progressing toward achieving each learning goal—and what they need to do to progress toward 3.0 and 4.0 levels of performance.

Action Step 5: Students chart their progress on each learning goal.

- ❑ Students are encouraged to self-evaluate and monitor their own progress relative to each learning goal and their related achievement scores.

Action Step 6: Recognize and celebrate growth.

- ❑ Knowledge gain is the currency of student success in a formative assessment system.
- ❑ Acknowledge students in a way that promotes their self-regulation.

Observations, Reflections, Questions:

The following action steps and related strategies seem especially promising for establishing and communicating learning goals to our students:

The following action steps and related strategies seem especially promising for improving our ability to track student progress:

The following action steps and related strategies seem especially promising for improving the way we celebrate success with our students:

A & S Design Question 2: What will I do to help students effectively interact with new knowledge?

- ❑ As students interact with new knowledge (including information and skills and procedures), they benefit from carefully constructed input experiences.
- ❑ Key design principles associated with effective “critical-input” experiences include: (1) using a variety of modalities (visual, dramatic, verbal); (2) previewing; (3) presenting information in small, “brain-compatible” chunks (i.e., not overwhelming students with too much initial information); (4) active processing using “macro-strategies” (e.g., summarizing and note-taking, non-linguistic representations, higher-order questioning, student reflection and self-regulation, and cooperative learning)

Action Step 1: Identify critical-input experiences.

- ❑ Design learning experiences that present new content (declarative or procedural) to students in such a way that they are “hooked” and engaged—and clearly understand both what they are learning and why they are learning it.
- ❑ Use a combination of modalities (visual instruction, dramatic instruction, and verbal instruction) to reinforce students’ understanding and ownership of new content.

Action Step 2: Preview the content prior to a critical-input experience.

- ❑ Help students to start thinking about new content and why they are learning it.
- ❑ Ausubel (1998) and others recommend using “advance organizers” to help students understand the purpose of learning new knowledge and how it is organized (e.g., outlines, syllabus, essential questions).
- ❑ Use cueing strategies, providing students with direct links between new content and content previously taught and learned.
- ❑ Specific previewing strategies include: (1) What Do You Think You Know? (2) Overt Linkages (3) Preview Questions (4) Brief Teacher Summaries (5) Skimming (6) Teacher-Prepared Notes.

Action Step 3: Organize students into groups to enhance the active processing of information.

- ❑ Cooperative learning allows students to experience content from multiple perspectives.
- ❑ Group interaction not only facilitates knowledge development but also creates awareness that is difficult if not impossible to achieve without interaction.
- ❑ According to Marzano, pairs and triads are most effective in processing information.
- ❑ Help students to acquire, integrate, and apply operating rules essential to group success, e.g., (1) Be willing to add your perspective to any discussion. (2) Respect the opinions of other people. (3) Make sure you understand what others have added to the conversation. Be willing to ask questions if you don’t understand something. (4) Be willing to answer questions other group members ask you about your ideas.

Action Step 4: Present new information in small chunks and ask for descriptions, discussion, and predictions (esp. using “macro-strategies”).

- ❑ The most effective teachers use “small steps” in presenting new material. Our working memory—where we process new information—is small and can handle only a few bits of information at one time—Too much swamps our working memory.

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- ❑ Students need to actively process new content using such processes as describing, discussing, and making predictions.
- ❑ Part of this active process should involve “macro-strategies” designed to increase students’ abilities to (1) cumulatively review information read, (2) sequence information, (3) summarize paragraphs and issues, (4) state main ideas in as few words as possible, and (5) predict and check outcomes. (Barley et al., 2002, p. 84 [Marzano, p. 35].
- ❑ Additional macro-strategies include summarizing and note taking, esp. three-column notes: (1) running notes; (2) summaries and highlights of big ideas, terms, and questions; and (3) non-linguistic representations.
- ❑ As part of their work with macro-strategies, students should be encouraged to encode information in non-linguistic and visual form (e.g., mental images, graphic organizers, physical models, pictographs), including student-constructed mnemonic devices.
- ❑ Macro-strategies also include: (1) various forms of higher-level questioning (e.g., inferential, elaborative interrogation, predictive) and (2) student reflection (e.g., reviewing critical-input experiences and identifying points of confusion and levels of certainty).
- ❑ Marzano also reinforces the value of the following: (1) reciprocal teaching, (2) cooperative learning JIGSAWS, and (3) concept attainment.

Action Step 5: Ask questions that require students to elaborate on information.

- ❑ Throughout *The Art and Science of Teaching*, Marzano reinforces the value of higher-order questions, including: (1) general inferential questions (e.g., default questions requiring students to use their own background knowledge and (2) questions requiring students to reason logically with information presented.
- ❑ Elaborative interrogations extend initial inferential responses to include: (1) Why do you believe this to be true? and (2) Tell me why you think that is so. They can also include: (3) What are some typical characteristics or behaviors you would expect of _____ ? (4) What would you expect to happen if _____ ?

Action Step 6: Have students write out their conclusions or represent their learning non-linguistically.

- ❑ As students extend and refine their knowledge of new content, they can more deeply process new information by using one of five strategies: (1) three-column notes (running notes, summaries, visual representations); (2) graphic organizers (e.g., characteristic patterns, sequence patterns, process/cause patterns, problem/solution patterns, and generalization/supporting detail patterns); (3) dramatic enactments, (4) mnemonic devices employing imagery (e.g., symbols and substitutes, rhyming pegwords, link strategies); and (5) academic notebooks (a compilation of entries that provide partial records of instructional experiences a student had in her or his classroom for a certain period of time, Ruiz-Primo, Li, and Shavelson, 2001, P. 56 of Marzano).

Action Step 7: Have students reflect on their learning.

- ❑ At the completion of critical-input experiences, ask students to actively process information learned.
- ❑ Useful reflective questions (Cross, 1998; Ross, Hogaboam-Gray & Rolheiser, 2002, p. 57) include: (1) What were you right and wrong about? (2) How confident are you about what you have learned? (3) What did you do well during your learning experience and what could you have done better?

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Observations, Reflections, Questions:

We need to use the following strategies to enhance students' critical-input experiences:

Our students might benefit if we did more with the following previewing strategies:

We should explore the following strategies for organizing students into groups to enhance their active processing of information:

The following strategies seem promising for presenting new information in small chunks and asking students for descriptions, discussion, and predictions:

We should expand our emphasis on the following elaborative questioning strategies:

Our students need to do more with using the following strategies designed to help them write their conclusions and represent their learning non-linguistically:

Our students can improve their ability to reflect on their own learning by:

A & S Design Question 3: What will I do to help students practice and deepen their understanding of new knowledge?

- ❑ Actively processing information is the beginning point of learning.
- ❑ Students should be engaged in the active construction of knowledge and understanding via: (1) schema development (accretion and tuning, i.e., gradual accumulation or addition of knowledge over time and the expression of that knowledge in more parsimonious packages) and restructuring (Piaget's accommodation, i.e., reorganizing knowledge so that it might produce new insights).
- ❑ Students deepen their understanding of procedural knowledge (i.e., skills, procedures, processes) through a process of initial modeling followed by shaping (guided practice involving rehearsal and correction of missteps and misunderstandings) and eventual internalization (i.e., automaticity, i.e., independent application and automatic conceptual transfer).
- ❑ Students deepen their understanding of declarative knowledge (i.e., information such as facts, concepts, generalizations, rules, theories, principles) through reviewing and revision via the processes of constructing meaning, organizing information mentally, and storing key information in long-term memory.
- ❑ Homework can be extremely useful in helping students to practice and deepen their understanding of new knowledge when it is designed to help students extend and refine their learning (with reasonable time requirements, clear purpose, clear alignment with identified learning goals, allowance for independent performance, and assurance that it is commented upon and used as part of the teaching-learning process when it is due).

Action Step 1: Provide students with tasks that require them to examine similarities and differences.

- ❑ Have students identify and analyze similarities and differences using such strategies as: (1) sentence stems; (2) visual organizers (e.g., Comparison Charts, Venn Diagrams, Double Bubble); (3) classification activities (e.g., classification charts and matrices); and (4) creating metaphors and analogies.

Action Step 2: Help students to identify errors in their thinking.

- ❑ Teach students to analyze and evaluate faulty logic (e.g., contradiction, accident, false cause, begging the question, evading the issue, arguing from ignorance, composition/division).
- ❑ Teach students to analyze and evaluate "attacks" (e.g., poisoning the well, arguing against the person, appealing to force).
- ❑ Teach students to identify, analyze, and evaluate the impact of weak reference (e.g., sources that reflect biases, sources that lack credibility, appealing to authority, appealing to the people, appealing to emotion).
- ❑ Teach students to identify and evaluate the impact of misinformation (e.g., confusing the facts, misapplying a concept of generalization).

Action Step 3: Provide opportunities for students to practice skills, strategies, and processes.

- ❑ Initially provide structured practice sessions spaced close together.
- ❑ Provide practice sessions that are gradually less structured and more varied.

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- ❑ When appropriate, provide practice sessions that help students develop fluency (including a fairly wide array of exercises so as to expose students to different contexts in which the procedure might be executed. Additionally, the teacher should consider accuracy and speed in these practice sessions along with further shaping of the procedure).

Action Step 4: Determine the extent to which cooperative groups will be used.

- ❑ Use a variety of cooperative learning structures that allow for varied roles and both individual and group accountability.
- ❑ After individual students have worked through a practice activity, have them meet in small groups to check their work for accuracy and describe their personal approaches to the exercises.

Action Step 5: Assign purposeful homework that involves appropriate participation from home.

- ❑ Use homework for three interrelated purposes: (1) to help students deepen their knowledge, (2) to enhance students' fluency with procedural knowledge, and (3) to introduce new content.

Action Step 6: Have students systematically revise and make connections in their academic notebooks.

- ❑ Ensure that students have multiple exposures to content, allowing them to shape and sharpen their knowledge.
- ❑ Have students make new entries in their notebooks after homework has been corrected and discussed.
- ❑ Students can reexamine the entries at any point in time—to encourage review of what they have recorded, emphasizing identification of those things about which they were accurate initially and those things about which they were inaccurate initially.
- ❑ Use notebook entries to capture students' awareness and insights they may have not recorded before.
- ❑ Have students compare entries in their notebooks. Members of a review group identify what they agree on as a group, what they disagree on, and questions they still have about the content. In turn, groups can report out to the whole class, with instructor addressing common agreements, disagreements, and questions.

Observations, Reflections, Questions:

Our students might benefit if we placed greater emphasis upon the following strategies designed to help their “schema development,” ensuring that they organize and store what they are learning in cohesive ways:

Our students might benefit if we placed greater emphasis upon the following strategies designed to help them construct meaning about, organize, and store declarative knowledge:

Our students might benefit if we placed greater emphasis upon the following strategies designed to help them construct meaning about, organize, and store procedural knowledge:

Our students might benefit if we placed greater emphasis upon the following strategies related to our use of homework to enhance learning:

As we conclude our discussion of this action step, I would suggest that we follow up with more discussion of the following strategies: (1) examining similarities and differences; (2) error analysis, including faulty logic, attacks, weak references, and misinformation; (3) practicing skills, strategies, and processes; (4) cooperative learning:

A & S Design Question 4: What will I do to help students generate and test hypotheses about new knowledge?

- ❑ As students progress beyond basic levels of knowing, they should be engaged in tasks that require them to experiment with the new knowledge, i.e., generating and testing hypotheses about it.

Action Step 1: Teach students about effective support.

- ❑ Help students to understand that valid claims must be supported (grounds); the support should be explained and discussed (backing); and exceptions to the claims should be identified (qualifiers).
- ❑ Teach students to recognize and assess the impact of limits when analyzing statistical information: (1) regression toward the mean; (2) errors of conjunction; (3) keeping aware of base rates; (4) understanding the limits of extrapolation; and (5) adjusting estimates of risk to account for the cumulative nature of probabilistic events.

Action Step 2: Engage students in experimental inquiry tasks that require them to generate and test hypotheses.

- ❑ Encourage students to make a prediction based on observations and design an experiment to test that prediction—and then examine the results in light of the original prediction.

Action Step 3: Engage students in problem-solving tasks that require them to generate and test hypotheses.

- ❑ Ask students to use knowledge in a highly unusual context or a situation that involves constraints. Challenge students to determine what must be done differently given the unusual context or constraint.
- ❑ Prior to engaging in a problem-solving task, students should predict how the new context or constraint will affect the situation.
- ❑ At the conclusion of a problem-solving task, students should restate their predictions and then contrast them with what actually occurred. They should describe their conclusions with well-structured support.

Action Step 4: Engage students in decision-making tasks that require them to generate and test hypotheses.

- ❑ Decision-making tasks require students to select among equally appealing alternatives.
- ❑ Ask students to begin by identifying alternatives to be considered.
- ❑ Next, students address the criteria by which alternatives will be judged.
- ❑ With alternatives and criteria identified, students complete the decision-making process (e.g., using a decision matrix).

Action Step 5: Engage students in investigation tasks that require them to generate and test hypotheses.

- ❑ Investigation is the testing of hypotheses about past, present, or future events.
- ❑ Historical investigation involves answering questions about what really happened or why did “X” happen?

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- ❑ Projective investigation involves answering questions such as: “What would happen if _____?”
- ❑ Definitional investigation involves answer questions such as: “What are the important features of _____?” or “What are the defining characteristics of _____?”

Action Step 6: Have students design their own tasks.

- ❑ As students demonstrate growing proficiency and independent understanding of new knowledge, the teacher can encourage them to design their own tasks, asking: (1) Is there a particular experiment you would like to conduct using the information we have been studying? (2) Is there a particular problem you would like to examine using the information we have been studying? (3) Is there a particular decision you would like to examine using the information we have been studying? (4) Is there a particular concept you would like to examine, past event you would like to examine, or hypothetical event you would like to examine using the information we have been studying?

Action Step 7: Consider the extent to which cooperative learning structures will be used.

- ❑ Information gathering for hypothesis generation and testing can be conducted in small groups.
- ❑ Groups can also work together to organize information, take a position, or related complex processes involved in hypothesis generation and testing.

Observations, Reflections, Questions:

The following are areas in our school and curriculum where students are already being asked to generate and test hypotheses about new knowledge:

We need to emphasize more the following strategies related to our students’ construction of effective support for claims and assertions:

We might enhance our students' performance by having them engage in experimental inquiry tasks in the following grade levels and content areas:

We might enhance our students' performance by having them engage in problem-solving tasks involving generating and testing hypotheses in the following grade levels and content areas:

We might enhance our students' performance by having them engage in decision-making tasks involving generating and testing hypotheses in the following grade levels and content areas:

We might enhance our students' performance by having them engage in investigation tasks involving generating and testing hypotheses in the following grade levels and content areas:

We might consider the following grade levels or content areas as venues for having students design their own tasks and engage in cooperative learning structures:

A & S Design Question 5: What will I do to engage students?

- ❑ Keeping students engaged is one of the most important considerations for effective teaching and learning.
- ❑ Engagement includes levels of student participation and time on task.
- ❑ Marzano cites three types of engagement in the research literature: behavioral (on-task behavior), emotional, and cognitive.
- ❑ He also cites five areas that can provide useful insights into how teacher might increase student engagement: (1) high energy; (2) finding missing information; (3) engaging the “self-system” (As described by McCaslin et al. [2006, p. 102 of draft of A & S of Teaching], teachers need to engage the “I” self—i.e., the composite of everything the individual finds interesting and valuable—the source of more enduring, natural, and higher-order self-concept vs. the “me” self—the working self-concept that is the source of motivation and self-regulatory strategies in a particular context); (4) mild pressure; and (5) mild controversy and competition.

Action Step 1: Use games that focus on academic content.

- ❑ Games can include: (1) What Is the Question (variations on *Jeopardy!*); (2) Name That Category (variations on *The \$100,000 Pyramid*); (3) Talk a Mile a Minute (identifying category titles for lists of words); and (4) Classroom Feud (variations on *Family Feud*).

Action Step 2: Use inconsequential competition.

- ❑ Use the principle of mild pressure to engage students in fun, friendly competitions (e.g., keeping track of points won over the course of the week as students play games such as those identified in Action Step 2).

Action Step 3: Manage questions and response rates.

- ❑ Reinforce students’ interest in missing information and mild pressure via open-ended questioning and related wait time.
- ❑ Wait time research identifies a range of strategies: (1) post-teacher-question wait time (allowing at least 3 seconds for students to respond); (2) within-student pause time (allowing time for students to think during pauses); (3) post-student-response wait time (pause a few seconds between the time a student has completed a response and before allowing other students to respond); (4) teacher pause time (allowing students to process and formulate thoughts and questions regarding new information); and (5) impact pause time (using uninterrupted silence to create a sense of anticipation about what will occur next).
- ❑ Response cards allow students to present individual responses as part of a whole-group activity, allowing the instructor to assess their reactions and understanding of material. Questions posed can include: (1) forced-choice, (2) multiple-choice, (3) fill-in-the-blank, and (4) class votes.
- ❑ Choral responses—i.e., unison responses—can be used to help students review important generalizations and principles about which there seems to be some confusion.
- ❑ Response chaining involves linking or chaining students’ responses, beginning with asking a question to which a specific student responds with the class then voting on the accuracy of that response, using three options: (1) the answer was correct, (2) partially

correct, or (3) incorrect. Follow-up responses and discussion are aligned with the option chosen.

Action Step 4: Use physical movement.

- ❑ Brain-based teaching and learning research reinforces the importance of incorporating physical activity and movement in your classroom.
- ❑ Specific strategies include: (1) stand up and stretch; (2) body representations (students act out important content); (3) give one, get one (while students stand, they use academic notebooks compare notes with a partner, identifying shared information and information that they didn't record); and (4) vote with your feet (students move to corners with signs identifying their reaction to the answer to a question: incorrect, partially correct, totally correct).

Action Step 5: Use appropriate pacing.

- ❑ Pacing and flow are mentioned in almost every discussion of effective classroom management.
- ❑ An important pacing issue involves transitioning from one activity to another, reinforcing an overall logic to the manner in which a lesson proceeds with that logic discernable to students.

Action Step 6: Demonstrate intensity and enthusiasm for content.

- ❑ In situations that are critical for student learning, teacher intensity and enthusiasm should be most clearly evident: In addition to the words being spoken, everything about the teacher's tone and manner communicates to that student that what is being said is important and that they should give it their full attention and ask questions about anything they do not understand (Good and Brophy, p. 238 [2003], cited on page 113 of manuscript).

Action Step 7: Engage students in friendly controversy.

- ❑ Have students participate in dialogue about topics about which they have differing opinions.
- ❑ As much as possible, engage students in "friendly" debate, including movement strategies such as asking students who take one position to move to one side of the classroom and those with the opposite position to the other side, with those not attached to either position standing in the middle. Selected students from each group "present their case."

Action Step 8: Provide opportunities for students to talk about themselves.

- ❑ Create situations in which students can talk about and involve their personal interests in significant classroom tasks related to identified learning outcomes.
- ❑ These kinds of activities can involve students' creation of metaphors, similes, and other forms of comparison.

Action Step 9: Provide unusual information.

- Engage students in exploring “missing information” to capture their attention (esp. in relationship to interesting but little know information—including information designed to help students overcome common misconceptions or myths about content studied).

Observations, Reflections, Questions:

Here are some areas in our school and curriculum in which student engagement might be enhanced via games that focus on academic content:

We might do more with inconsequential competition in the following areas:

The following strategies might help us improve the way we manage questions and student response rates:

The following physical movement strategies might enhance student engagement:

We might improve the pacing and flow of our activities by:

We could enhance our demonstration of intensity and enthusiasm for content by:

We could engage our students in friendly controversy in the following areas:

We could provide opportunities for students to talk about themselves by:

We could enhance student engagement by providing unusual information such as:

A & S Design Question 6: What will I do to establish or maintain classroom rules or procedures?

- ❑ Although rules and procedures should be established at the beginning of the school year, students need reminders of when rules and procedures must be added or altered.
- ❑ Rules establish general expectations or standards regarding student behavior.
- ❑ Procedures and routines describe those behaviors that will help to realize the rules.
- ❑ The utility of rules and procedures is enhanced if students have input into their design.

Action Step 1: Organize the classroom for effective teaching and learning.

- ❑ Make certain that the physical setting and arrangement of the classroom conveys a strong message regarding your approach to managing instruction and learning.
- ❑ Ensure that students have access to learning centers, technology, and equipment to support their achievement of identified learning goals.
- ❑ Decorate the room to reinforce student achievement of core learning goals and measurement topics.
- ❑ Ensure that materials are prepared and organized to support learning.
- ❑ Work with students to ensure that the physical arrangement of desks and chairs supports the learning process.

Action Step 2: Establish a small set of rules and procedures.

- ❑ Marzano cites research conducted by Emmer, Evertson, and Worsham (2003, p. 20, cited on P. 124 of draft) that teachers should employ no more than five to eight rules and procedures at the secondary level. This number is reinforced for use at the elementary level by researchers Evertson, Emmer, and Worsham (2003, p. 22).
- ❑ Focus your rules and procedures around the following areas: (1) general classroom behavior; (2) beginning and ending of the school day or period; (3) use of materials and equipment; and (4) seatwork and teacher-led activities.

Action Step 3: Interact with students about classroom rules and procedures.

- ❑ From the outset, have open and sustained dialogue with students about the nature of rules and procedures in your class and reasons for following them within the classroom as a community of learning.
- ❑ Devote class time to designing rules and procedures in partnership with students from the ground up.

Action Step 4: Periodically review rules and procedures, making changes as necessary.

- ❑ Use class discussions to engage students in reviewing rules and procedures, evaluating how they are working and identifying action steps for improving areas of weakness.

Action Step 5: Use classroom meetings.

- ❑ To formalize the review of rules and procedures, schedule classroom meetings regularly for 10 minutes at the beginning of a class (e.g., every Friday).

- Use these meetings to reinforce to students that the management of the classroom is in their control. They can shape the environment to produce a classroom that is respectful of individuals and accommodates the learning process.

Observations, Reflections, Questions:

We might improve our approach to organizing our classrooms for effective teaching and learning by:

To establish a small set of rules and procedures, we might eliminate or de-emphasize:

We need to do more with the following strategies related to our interactions with students about classroom rules and procedures:

We might review with students rules and procedures, making changes as necessary, by using strategies and processes such as the following:

Following are ways in which we currently use classroom meetings and ways in which we might expand our use of them:

A & S Design Question 7: What will I do to recognize and acknowledge adherence and lack of adherence to classroom rules and procedures?

- ❑ Teachers need to frequently reinforce students' adherence to rules and procedures as opposed to taking that adherence for granted. Similarly, teachers need to acknowledge lack of adherence to rules and procedures.
- ❑ Rules and procedures for which there are no consequences—positive and negative—do little to enhance learning.
- ❑ Stage and Quiroz (1997, cited on P. 132 of A & S) organized consequences into four general categories: reinforcement, punishment, no immediate consequences, and punishment and reinforcement. All four categories work, but a combination of positive and negative consequences appears to be the optimum approach.

Three action steps are identified for recognition of positive behaviors:

Action Step 1: Use simple verbal and non-verbal acknowledgment.

- ❑ This behavior can range from simple whole-group acknowledgment to identification of specific behaviors (individual or group) that are worthy of praise.
- ❑ Non-verbal acknowledgments are also effective, including smiles, nods, winks, thumbs-up signs, A-OK signs, etc.
- ❑ Curwin and Mendler (1988, cited on P. 137) suggest a strategy in their book *Discipline with Dignity* (p. 97): “About every 15 to 20 minutes, catch a student being good...speak softly so no other student can hear.”

Action Step 2: Use tangible recognition when appropriate.

- ❑ Tangible recognition involves any form of concrete recognition of student adherence to rules and procedures. These forms can include points or other daily recognition tokens.
- ❑ A variation is to code student behavior, with direct feedback given to students about the level of behavior observed.

Action Step 3: Involve the home in recognition of positive student behavior.

- ❑ According to the research cited by Marzano, students view the teacher or school contacting the home about their good behavior as a valued acknowledgment.
- ❑ Home involve strategies include: (1) phone calls home, (2) e-mails, (3) notes home, and (4) certificates of good behavior.

Six action steps are identified for dealing with negative student behaviors:

Action Step 4: Be “with it.”

- ❑ Jacob Kounin (1983, p. 7, cited on p. 135 of A & S text) described “withitness” in a teacher’s classroom as: “It was whether she demonstrated to her class that she knew what was going on, that she had eyes in the back of her head. It was not whether she came in right away but whether she came in before something spread or became more serious.”
- ❑ Brophy (1996, p. 11, cited on p. 135 of text) describes withitness in more technical terms: “Remaining ‘with it’ (aware of what is happening in all parts of the classroom at all times) by continuously scanning the classroom, even when working with small groups or

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- individuals. Also demonstrating this withitness to students by intervening promptly and accurately when inappropriate behavior threatens to become disruptive.”
- ❑ Talk privately to potentially disruptive students before class starts and engage in brief conversations about expectations for the day.
 - ❑ Use “stimulus cueing”: Provide a cue (e.g., a pre-arranged stimulus or sign) to selected students before inappropriate behavior occurs.
 - ❑ Occupy the entire room physically or visually: Move to all quadrants of the room systematically and frequently, making eye contact with all students.
 - ❑ Notice potential problems: e.g., small groups of student huddled together talking intensely, one or more students not engaging in class activity for an extended period of time, etc.
 - ❑ Use a series of graduated actions: Once a potential problem has been identified, seek out and extinguish the problem immediately.
 - ❑ Look at suspected students: Elicit the attention of suspected students, confirming you have noticed their behavior and that the behavior is not acceptable.
 - ❑ Move in the direction of students: If suspected behavior continues, move in the direction of offending students, still addressing the entire class, communicating the message: “Would you please cease what you are doing and join in what we are doing in class...Your participation is welcome and needed.”
 - ❑ Stop the class and confront the behavior: If students have not reengaged, directly and publicly confront their behavior in a calm and polite manner.

Action Step 5: Use direct-cost consequences.

- ❑ Direct cost involves explicit and concrete consequences for inappropriate behavior, especially when that behavior has progressed beyond a point where it can be addressed by withitness.
- ❑ Strategies related to direct-cost consequences include: (1) time-out; (2) over-correction (i.e., engaging students in activities that overcompensate for inappropriate behavior such as a student who has ripped pages of a book being required to repair the pages of all books in the class).

Action Step 6: Use group contingency.

- ❑ Hold the class as a whole responsible for the behavior of any and all members of the class.
- ❑ Two types of group contingency are identified in the research literature: (1) interdependent group contingency and (2) dependent group contingency.
- ❑ With interdependent group contingency, the entire class receives positive consequences only if every student in the class meets a certain behavioral standard.
- ❑ With dependent group contingency, positive and negative consequences are dependent upon the behavior of one student or a small group of students who have been singled out for behavioral change.
- ❑ Interdependent group contingency processes can be used to reinforce both positive and negative group behaviors in regular classrooms. Dependent group contingency processes are generally reserved for clinical use with students who have severe behavioral problems.

Action Step 7: Use home contingency.

- ❑ This process begins with a meeting between parents/guardians, the teacher, and the student to discuss and identify behaviors that need to stop in class.
- ❑ It is important that in such meetings the student has some input into both negative and positive consequences.

Action Step 8: Have a strategy for high-intensity situations.

- ❑ When a student is out of control and external resources (e.g., administrative) are not available, teachers can make use of a variety of strategies until help arrives.
- ❑ First, recognize that the student is out of control.
- ❑ Next, step back and calm yourself.
- ❑ Listen actively to the student and plan action. Use active listening until the student calms down.
- ❑ When student is calm, repeat a simple verbal request, e.g., “Jonathan, I want you to go with me outside in the hallway to discuss this further. Can we please do that now?”

Action Step 9: Design an overall plan for disciplinary problems.

- ❑ Glasser (1977, 1986), Good and Brophy (2003) all recommend that teachers outline steps in an overall plan for resolving conflicts with students and improving disciplinary behavior. Glasser especially emphasizes that the individual (both student and teacher) is responsible for his or her own behavior, including goals, decisions, and personal happiness (A & S text, p. 147).
- ❑ Glasser suggests the following approach: (1) List your personal reactions to student misbehavior; (2) Analyze the list and determine which of your behaviors are effective and which are not; (3) Make an attempt to improve your relationship with disruptive students; (4) Meet with student and point out the specific behaviors that need to be curtailed; (5) Make sure students understand and can describe the offending behavior; (6) If the offending behavior continues, help the student develop an explicit plan to curtail it. Keep refining the plan as needed; (7) If the offending behavior still persists, isolate the student from class until a renewed commitment is made on the part of the student; (8) If the previous steps do not work, in-school suspension is the next step. The student is continually invited to develop and execute a plan; (9) If the student remains out of control, parents are called and the student goes home for the day; (10) Students who do not respond to the previous steps are removed from school and referred to another agency (A & S text, pp. 147-148).

Observations, Reflections, Questions:

We are currently successful in using the following strategies and processes to recognize and acknowledge our students’ adherence and lack of adherence to classroom rules and procedures:

We might improve our approach to classroom management by doing more with the following action steps and related strategies for acknowledging students' adherence to rules and procedures:

1. Use simple verbal and non-verbal acknowledgment:

2. Use tangible recognition when appropriate:

3. Involve the home in recognition of positive student behavior:

We might improve our approach to classroom management by doing more with the following action steps and related strategies for acknowledging students' lack of adherence to rules and procedures:

4. Ensure that we are “with-it,” being proactive about potential problems:

5. Use the following direct-cost consequences and related strategies:

6. Use the following group contingency strategies and processes:

7. Use the following home contingency strategies and processes:

A & S Design Question 8: What will I do to establish and maintain effective relationships with students?

- ❑ According to Marzano, the quality of relationships teachers have with their students is the keystone of effective classroom management—perhaps even the entirety of teaching.
- ❑ Students need to be assured that their teacher is providing them sustained guidance and control in both behavioral and academic areas.
- ❑ The teacher must also provide students with a sense that they are a team devoted to the well-being of all participants.
- ❑ Classroom management problems frequently occur when there is a breakdown in teacher-student relationships, with teachers establishing a “we-they” stance with students.
- ❑ Effective classrooms reflect a balance between the teachers’ demonstration of dominance and appropriate amounts of cooperation.

Action Step 1: Know something about each student.

- ❑ Obtain information about students via such strategies as interest surveys and opinion questionnaires.
- ❑ Use parts of parent-teacher conferences to ask about and listen for critical details regarding students and important information about their life experiences.
- ❑ Become familiar with the local culture of students and how it may affect their learning.
- ❑ Incorporate informal discussions into class meetings: e.g., “Tell me about what’s happening in your lives these days” or “What are some things students are talking about that teachers should be aware of?”

Action Step 2: Engage in behaviors that indicate affection for each student.

- ❑ Greet students at the door each day.
- ❑ Take pictures of each student and post them on the bulletin board, with short statements from students that reflect their thoughts about the class.
- ❑ Attend after-school functions in which students participate (esp. alienated students).
- ❑ Develop a schedule to ensure that you personally interact with each student on a regular basis.

Action Step 3: Bring student interests into the content and personalized learning activities.

- ❑ Periodically draft classroom tasks that include student interests (individual or group).
- ❑ Use metaphors to allow students to express personal ways of constructing meaning about curriculum content (e.g., “Identify something in your life with this same pattern.”)

Action Step 4: Engage in physical behaviors that communicate interest in students.

- ❑ Consider how your non-verbal physical behaviors are—or might be—interpreted by your students.
- ❑ Consciously practice and engage in behaviors that communicate interest: e.g., smiles, appropriate physical signs of encouragement, looking students in the eyes, standing close to communicate concern or interest without invading personal space, and looking interested in what students have to say.

Action Step 5: Use humor when appropriate.

- ❑ When appropriate, engage in playful banter with students.
- ❑ Use historical and popular sayings to make a point (e.g., “I’ll be back...Four score and seven years ago...”).
- ❑ Use cartoons and jokes to illustrate a point.
- ❑ Laugh with your students—including laughing at yourself.
- ❑ Use puns and plays on words (e.g., “Always avoid alliterations!”)

Action Step 6: Consistently enforce positive and negative consequences.

- ❑ As suggested in previous action steps, effective teachers establish clear learning goals, rules and procedures, and positive and negative consequences related to those rules and procedures.
- ❑ Strive to ensure that students perceive you as very clear about the behavior you expect.
- ❑ Consequences must be executed consistently and fairly. Therefore, be aware of the extent to which positive and negative consequences are applied to specific behaviors.
- ❑ A self-reflection questionnaire or checklist might be useful as an after-class review for yourself.

Action Step 7: Project a sense of emotional objectivity.

- ❑ Strive to establish a consistent tone in your classroom that reflects emotional balance and objectivity.
- ❑ Behave in a way that communicates care and concern equally for every student.
- ❑ Monitor your own thoughts and emotions, examining your reactions to each student and identifying the sources of negative thoughts and emotions.
- ❑ When necessary, “reframe” your reactions, striving to explain students’ behaviors in terms that are not threatening or offensive to you. Attempt to view students’ actions in a way that gives them the benefit of the doubt.
- ❑ Know your “hot buttons” and emotional triggers, maintaining appropriate emotional distance from disciplinary incidents and establishing opportunities for clearer thinking and more productive interactions.

Action Step 8: Maintain a cool exterior.

- ❑ Project a classroom demeanor that avoids extremes, especially when you are angry with a student.
- ❑ Guard against volatile behaviors such as physical gestures, raised tone of voice, glaring, and ridiculing the student.
- ❑ Speak directly in a calm and respectful tone of voice, looking directly at the student with appropriate facial gestures and physical distance.
- ❑ When necessary, express anger appropriately. For example: pointing out specific student behaviors considered offense and related reactions, using a calm and even tone of voice and commenting on observed behaviors—rather than motives.

Observations, Reflections, Questions:

The following are areas in which teacher interactions with students might be enhanced or improved in our school:

We should expand our use of the following strategies to make certain we all know something about each of our students:

To indicate affection for each student, we should consider doing the following:

Here are some potentially useful ways we can bring student interests into our content and personalize learning activities:

The following physical behaviors have potential for enhancing our students' sense that we are interested in them and their growth as individuals:

We might all use the following strategies to use humor to maintain positive relationships with our students:

When thinking about disciplinary problems in our school, we need to do the following to more consistently enforce positive and negative consequences:

We all might do more of the following to project a sense of emotional objectivity:

I would recommend the following to new teachers to help them maintain a cool exterior and emotional objectivity:

A & S Design Question 9: What will I do to communicate high expectations for all students?

- ❑ Research confirms that the teacher’s beliefs about a student’s chances of success in school influence how that teacher acts toward that student (strongly influence his or her achievement).
- ❑ According to Marzano, if the teacher believes that students cannot succeed, he or she unwittingly tends to behave in ways that subvert student success—or at least do not facilitate student success.
- ❑ Key ways in which teachers—often unconsciously—communicate expectations to students include their (1) affective tone (i.e., the extent to which the teacher establishes positive emotions in the classroom and reinforces cooperative behavior) and (2) quality of interactions with students (i.e., high vs. low expectancy behaviors such as creating more output opportunities for high-expectancy students when answering questions or responding to learning tasks).

Action Step 1: Identify your expectation levels for students.

- ❑ Become aware of your own differential expectations for various students, identifying any that you may have inadvertently considered to be “low expectancy.”
- ❑ Where appropriate, change your behavior toward students so that all learners receive the same behavior in terms of affective tone and quality of interactions.
- ❑ Determine if you have any systematic bias regarding low-expectancy students (e.g., generalized low expectations for students based on their economic status, ethnicity, socio-economic status, etc.).

Action Step 2: Identify differential treatment of low-expectancy students.

- ❑ Enhance affective tone by ensuring consistent levels of eye contact, smiles, proximity, and playful dialogue for all students.
- ❑ Ensure that the same quality of interactions is conveyed to all students, including equal levels of calling on all students, comparable levels of higher-order questions, parallel levels of follow-up probing and requests for evidence to support claims, and not rewarding some students for less rigorous responses.

Action Step 3: Make sure low-expectancy students receive verbal and non-verbal indications that they are valued and respected.

- ❑ When low-expectancy students have been identified, strive to consciously and systematically engage in behaviors that convey that all learners are valued and respected: e.g., (1) frequent eye contact; (2) smiling at appropriate times; (3) occasional gestures to confirm acceptance; (4) maintaining appropriate proximity; and (5) when appropriate, engaging in playful dialogue with target students.

Action Step 4: Ask questions of low-expectancy students.

- ❑ While helping low-expectancy students to perceive themselves as respected and valued in your class, ensure that when they ask unsolicited questions, they perceive your response as complete and respectful.

- ❑ When students are responding to questions you have asked, employ a system to ensure that low-expectancy students are encouraged to answer. For example, use random calling or maintain a record of response patterns, encouraging non-responsive students to answer questions (avoiding predictable answers from a limited number of high-responding students).

Action Step 5: When low-expectancy students do not answer a question correctly or completely, stay with them.

- ❑ Devote as much time as with low-expectancy students as high-expectancy students when responding to incorrect or incomplete answers to a question or task.
- ❑ Use elaborative interrogation strategies (presented in Action Step 5, Question 2) to help low-expectancy students to reflect on: “How do you know this to be true?” “Why is that so?” “What evidence can you give us to support that conclusion?”
- ❑ Use what a student has communicated about what he or she understands—and does not understand—to help students overcome gaps and misinformation.
- ❑ Interject a variety of ways to communicate students’ responses are valued, including: (1) Demonstrate gratitude for students’ responses; (2) Don’t allow negative comments from other students; (3) Point out what is correct and incorrect about students’ responses; (4) restate the question; and/or (5) Provide ways to temporarily let students off the hook (e.g., “I’ll give you time to think about that, and then we’ll come back to you.”)

Observations, Reflections, Questions:

The following appear to be issues we need to address about how we communicate expectations to our students, especially those who may be underachieving or underperforming:

We need to consider the following data sources to help us identify low-expectancy and high-expectancy students in our classes:

I would recommend that we all examine the following teacher behaviors that identify differential treatment of low-expectancy students in our school and classrooms:

We need to all adopt for regular use the following verbal and non-verbal behaviors that communicate to students they are valued and respected:

We can improve our use of questioning strategies and equitable response patterns by:

A & S Instructional Design Question 10: What will I do to develop effective lessons, organized into a cohesive unit?

- ❑ Marzano cites a variety of researchers, including Benjamin Bloom, who assert that everything else being equal, a teacher who designs and organizes academic tasks well will produce better student learning than a teacher who does not.
- ❑ Bennett and Desforges (1988, cited on P. 175 of manuscript) classify academic tasks into four broad categories: incremental and practice (focused on practice, review, and revision) and restructuring and enrichment (emphasizing hypothesis generation and testing).
- ❑ As Marzano suggests throughout *The Art and Science of Teaching*, task design has an effect on student achievement, with complex, well-designed tasks facilitating deeper levels of learning and higher engagement.
- ❑ Effective lessons and cohesive units require instructors to generate contingency plans based on: (1) the nature of what they are teaching (i.e., craft knowledge), (2) how students respond to how they are teaching, and (3) related (and inevitable) human experiences involving student-teacher and student-student interactions.

Action Step 1: Identify the focus of a unit of instruction.

- ❑ According to Marzano, identification of the unit's focus is the first decision a teacher should make because it affects so many other aspects of the unit.
- ❑ Three basic areas of focus can be used to design a unit: (1) knowledge (i.e., focusing on specific elements of information and skill); (2) issues (while emphasizing important standards, the teacher also reinforces students' exploration of significant issues, problems, and decisions, focusing the middle and end of the unit around a hypothesis generation and testing task(s); and (3) student exploration (once students demonstrate proficiency with specific learning goals, they identify their own essential questions to explore such a hypothesis, problem, decision, future event, etc.).

Action Step 2: Plan for lesson segments that will be routine components of every lesson.

- ❑ Use daily lessons within the unit structure to delineate: (1) segments that will most likely be part of every lesson, (2) segments that focus on content (declarative and procedural), and (3) segments that address actions that must be taken on the spot.
- ❑ Marzano poses two design questions for every lesson: (1) What will I do to establish and communicate learning goals, track student progress, and celebrate success? (Design Question 1); (2) What will I do to establish or maintain classroom rules and procedures? (Design Question 6)
- ❑ Four specific issues should become a part of every daily lesson: (1) rules and procedures; (2) communicating learning goals; (3) tracking student progress on learning goals; and (4) celebrating success on learning goals.

Action Step 3: Plan for content-specific lesson segments.

- ❑ Three design questions relate to lesson segments that emphasize content: (1) What will I do to help students effectively interact with new knowledge? (Design Question 2); (2) What will I do to help students practice and deepen their understanding of new knowledge? (Design Question 3); and (3) What will I do to help students generate and test hypotheses about new knowledge? (Design Question 4)

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- ❑ In responding to these design questions, teachers should determine: (1) Will students be presented with a critical-input experience? (i.e., when learning about new knowledge); (2) Will students be presented with an activity that helps them practice or deepen new knowledge? (3) Will students be presented with a hypothesis-generation and testing task or asked to work on such a task that was started previously?
- ❑ For lesson segments in which students engage in critical-input experiences, teachers should ask themselves: (1) Am I being sensitive to the need for a variety of mediums for critical-input experiences? (2) Will I augment the critical-input experience by using anecdotes and narratives? (3) What specific techniques will I use to ensure that students actively process the new information and what will my role be in those activities? (4) How will grouping be used in those activities?
- ❑ For lesson segments in which students practice and deepen their knowledge, teachers should consider: (1) What practice activities will I use and what is my role during those activities? (2) Am I using a variety of practice activities? (3) What knowledge-deepening activities will I use and what is my role during those activities? (4) Am I using a variety of knowledge-deepening activities? (5) What will the role of homework be in these activities? (6) How will grouping be used in these activities?
- ❑ For lesson segments devoted to hypothesis generation and testing tasks, teachers should ask themselves: (1) What will I do to facilitate the hypothesis generation and testing task that has been assigned? (2) What will my role be during these activities? (3) What will be the role of homework during these activities? (4) How will grouping be used during these activities?

Action Step 4: Plan for actions that must be taken on the spot.

- ❑ This final type of lesson segment involves activities and behaviors that can be required at any point during a lesson.
- ❑ Marzano states that four of the design question in his text deal with such activities and behaviors: (1) What will I do to engage students? (Design Question 5); (2) What will I do to establish and maintain consequences for not following rules and procedures? (Design Question 7); (3) What will I do to establish and maintain effective relationships with my students? (Design Question 8); and (4) What will I do to communicate high expectations for all students? (Design Question 9).

Action Step 5: Develop a flexible draft of daily unit activities.

- ❑ Sketch out the major activities of the unit, ensuring the major focus areas of the unit are addressed sufficiently within your time constraints.
- ❑ This preliminary outline should map out the overall picture of the unit, but is easily changed as circumstances dictate.

Action Step 6: Review critical aspects of effective teaching daily.

- ❑ Use the daily questions Marzano presents as a checklist or self-assessment in designing and implementing your units.
- ❑ Marzano presents “Questions for Daily Reflection” related to: (1) lesson segments devoted to routine activities and behaviors (e.g., rules and procedures, communicating learning goals, tracking student progress on learning goals, and celebrating success on learning goals); (2) lesson segments devoted to content (e.g., critical-input experiences, knowledge practice and deepening activities, hypothesis generating and testing tasks);

and (3) lesson segments devoted to activities that must be executed on the spot (e.g., engagement, consequences for rules and procedures, relationships, and expectations).

Observations, Reflections, Questions:

What are your reflections on how Marzano's unit design suggestions are reflected in your school or district's lesson and unit planning requirements?

To what extent do your own unit designs (or those of individuals you supervise) reflect one or more of the focus areas Marzano identifies?

Which of Marzano's recommendations for design questions and strategies that should be routine in all daily lessons seem especially significant or useful to you?

Which of Marzano's suggestions for content-based lesson segments would you recommend be emphasized more in your school or district?

How would you explain Marzano's concept of lesson segments that are devoted to activities that must be executed "on the spot"? Which of his recommendations would you suggest be more extensively emphasized in your own classroom, school, or district? Why?
