The Eliciting Prompt: Initiating Student Questioning Via Spontaneous Observation

The *eliciting prompt* is a tool that is used to engage students. The prompt itself may take any of a number of forms. Regardless of the form taken, a common feature all good prompts share is *parsimony*—the very nature of the prompt is *simple* (note that this is not intended to connote conceptual simplicity). Its intent is to spur some purposeful action on the part of the students, and though often referred to by different names, it is put to just that use in some form in almost every subject.

Many of us have heard of, and even been tested by, the writing prompt. The purpose of the prompt in this case was to elicit a written explanation—typically an essay or some other expository writing assignment. Likewise, a word problem in mathematics is a prompt, only its intended response is usually a sequence of numerical exercises toward a quantifiable solution. In both cases the prompt is written. In many cases, the prompt is a reading exercise, or, as often in science, a hands-on activity or demonstration. However, in all of these cases the prompt's intent is to elicit—either in written or verbal/oral form—an explanation on the part of the student, or a set of questions from which guided inquiry or investigation may follow. As prompts have clear value toward this end, they are very fitting and useful tools for assessing achievement via the quality of explanation or questions they elicit. Given that there are legitimate differences in perspectives (National Research Council [NRC], 1996), prompts by their very simplicity reveal a wide range of understandings from students—none of which are essentially right or wrong, only different. The assessment standards of the *National Science Education Standards* (NRC, 1996) describe this situation using an example of a thorough yet uniquely different understanding of respiration likely to be held by a physicist, a physician, and a cell biologist. This variance in responses to an eliciting prompt is noted across uses.

When the eliciting prompt is employed at the outset of a planned set of task or investigation—usually around a certain topic, historical event, or natural phenomenon—students' observations tend, as expected, to be widely divergent due to the differences in experience and background (just as the physicist, physician, and cell biologist we discussed above). However, this very divergence can be harnessed for the purpose of learning, along with the interest and excitement a good prompt elicits as an added value. Approaches that capitalize on the many different observations and

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subsequent explanations and questions students generate as a result of an eliciting prompt assist students in establishing a course of inquiry—a coherent plan for upcoming investigations. Some approaches, in fact, thrive on it.

In science classes, one such approach—the Investigation-Colloquium Method (I-CM) (Lansdown et al., 1971)—employs concrete material experiences, which are followed by several stages of progressive and thoughtful dialogic interactions and formulation of explanations and questions, leading eventually to testing (analogous to delving deeper into analysis) of the explanation and/or line of further questions. For more details, read the Investigation-Colloquium Method (http://www.designedinstruction.com/learningleads/investigation-colloquium.html).

In history classes, historians (Nelson & Drake, 2001; Wineburg, 1991, 2001) advocate student exposure and interaction around one or more key primary sources before engaging in deeper historical source and contextual analysis. Though perhaps a different focus than in the I-CM, the purpose of prompt and subsequent dialogue remain the same—to establish a foundation of experience-based observations along with tentative explanations and initial operational questions. In fact, it is considered a necessity if students are to have a firm enough grasp of the historical sourcing heuristic to be able to proceed with deeper analysis in a manner befitting an historian, and in a manner allowing them to meet the learning goals described in *Building a History Curriculum* (Bradley Commission on History in Schools [BCHS], 1988) and discussed in the historical thinking standards of the *National Standards for History* (National Center for History in the Schools [NCHS], 1996). For more insight into the connection of reading comprehension and students' abilities to read primary and secondary text sources, read our article Reading Comprehension and Historical Thinking: Classroom Realities in Building a Context Connection (http://www.designedinstruction.com/learningleads/reading-historical-sources.html).

Check out these related articles:

To find out more about the Bradley Commission, go to http://www.designedinstruction.com/reports/about_bradley_commission.html

To find out more about the *National Standards for History*, go to http://www.designedinstruction.com/reports/about_history_standards.html

To read more the interface between reading and addressing history standards, check out our Research Précis - Contextualized Learning: Addressing Standards in History (http://www.designedinstruction.com/research/brief_ed_02_2.html)

In mathematics classes, the above trend holds with even a further broad value. Research findings indicate an international disparity between math students' perceptions of reality and mathematics problems (Verschaffel, De Corte, & Lasure, 1999; Verschaffel, De Corte, Lasure, Van Vaerenbergh, Bogaerts, & Ratinckx, 1999; Yoshida, Verschaffel, & De Corte, 1997). Mathematics prompts using realistic materials or scenarios, followed by discussion of the involved math concepts in the realistic contexts, have been shown to greatly improve not only their performance on learning measures related to achievement, but also (and very importantly) to their interest and their perceptions of the connection of math to the real world and their everyday lives.

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In our research-based article on Questioning and the Generative Student Investigation (http://www.designedinstruction.com/learningleads/question-generation.html) we outline a process for helping students develop the skills to generate operational questions. In doing so, we use a domain-specific example from both science and a history to tie together the original "why" question and the development of a controlling idea to guide further analysis or research of a situation (e.g., child labor) or phenomenon (e.g., visible color separation of the electromagnetic spectrum). We continue here with the same threaded examples. Consider the following sample prompts:

Seeing Red
(Science Example)

Hold a prism under a light and slowly rotate the prism so that the colors of the visible light spectrum appear on a sheet of white notebook paper.

As you do so, ask students to:

Lump of Coal
(History Example)

Read Mr. Coal's Story aloud to students. Where the story contains pictures, show the images on an overhead.

As you do so, ask student to:

Instructionally, there are numerous means by which we can move from the prompt—the students' physical experience with materials—to the interactive and dialogical stage. These can run from very open-ended discussions of observations during the prompt, concretization of observations (e.g., through notes or some other means) followed by structured dialogue, or even concretization of the dialogue itself. This last may represent some exceptional opportunities for helping students develop a multitude of skills across subject areas (e.g., listening, word and/or concept association, comparing and contrasting, and making inferences). In the *National Science Education Standards* assessment segment we discussed earlier, this was the approach used when students were asked in the "plant in a jar" prompt. In this illustration, students were asked to predict how long the plant would live given a certain set of described environmental constraints—read about the prompt at Chapter 5: Assessment in Science Education: Assessing Understanding of the Natural World (scroll down a short distance to "The Prompt") (http://www.nap.edu/readingroom/books/nses/html/5.html#aunw). Many of these exercises that help to make difficult concepts more concrete are organizational in nature—they are designed to help move verbal discussion and listening to a visual stage where new senses and learning mechanisms can come into play. Sometimes this is the result of simply seeing the conversation unfolding (e.g., notes, observational tables or t-charts, etc.) and sometimes it is the result of doing something with (manipulating) the information. Using a graphic organizer, for example, can provide a good mechanism for organizing and clarifying relationships through visual illustration. There are many types and uses, and ways in which they may be applied in numerous domain-specific (subject) studies. Read the Research Précis Contextualized Learning: Graphic Organizers and "Reading to Learn" (http://www.designedinstruction.com/research/brief_ed_02_3.html) for an overview of research behind addressing reading through use of graphic organizers. Similarly, for concretizing observations made during a science prompt, try

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working with students to create a graphic organizer to map the relationships among their observations.

We may also assume—and do not consider the connection to be tenuous in the least, especially where the prompt involves reading a text passage—that the use of pre-prompt questions to focus students' attention on certain observations that are particularly relevant has been proven effective through the same research that supports before/during/after reading techniques (Brown, Armbruster, & Baker, 1983; Taylor & Frye, 1992; Tei & Stewart, 1985). In the event that such may be useful, consider the following sets of pre-prompt observational focus questions, in line with our previous science and history examples:

Seeing Red
(Science Example)

Note whether the light passes straight through the prism to the paper.

Observe the order of colors and when light appears and disappears on the paper.

Note the relative sizes of the color bands that appear.

Lump of Coal
(History Example)

Observe the expressions of the children in the photographs.

Consider the tone of the story and the author's viewpoint.

Think about why the story was created and its purpose—what its sponsors hoped to achieve in the telling.

Though we strongly advocate seizing the opportunity presented by these situations to actually teach reading skills, regardless of the subject or topic—for details, see Reading Comprehension and Historical Thinking: Classroom Realities in Building a Context Connection (http://www.designedinstruction.com/learningleads/reading-historical-sources.html)—there are times where students' reading abilities present a barrier to learning that does not balance the need for the process with the domain-specific learning objectives at hand. In cases where students' reading abilities are questionable to the point where pre-reading focus questions are ineffective, we may choose to read the passage to students. Note that should we do so, we are still seeking student comprehension of the materials—only now *listening* comes into play. Even if the prompt is, for example, a science demonstration, students' listening skills can be activated by describing the demonstration verbally as it is performed. Regardless of whether or not listening is actively employed by students during the prompt, it is still relevant—it *will*, whether or not we wish, be activated during the discussion and structured dialogue that follows the prompt.

What are the constants?

Though different eliciting prompts may spur either qualitative or quantitative observations, and may be structured such as to address a wide range of grade and ability levels, there are some constant defining characteristics. An eliciting prompt:

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Is spontaneous. As a tool for engaging and focusing student attention, the prompt should be preceded by very little (note that *preceded by very little* refers to direct instruction with students, *not* very little preparation on the part of the teacher).

Results in a variety of responses. As a result of an eliciting prompt exercise, students will likely make a variety of observations. These will be different for different students, and all will likely be very unsystematic.

Begs observational, explanatory, and question-generative action on the part of students. Even if the prompt itself consists of a demonstration, the value of the prompt is in the reaction—tap that reaction by bringing out students' observations, thoughts, and questions, and help them learn how to apply that toward further useful learning.

Is effective when used as a part of a comprehensive approach toward student learning or assessment goals. Prompts are very supportive of other strategies, and are particularly effective when used in conjunction with a variety of other techniques toward a certain purpose. See Questioning and the Generative Student Investigation (http://www.designedinstruction.com/learningleads/question-generation.html).

Requires an active teacher role in orchestrating interactive dialogic follow-up. Though discussions may seem to take very different routes for each class, the general course of learning and the acquisition of skills that occurs along the way are anything but random. To get the most out of an eliciting prompt, read about the Investigation-Colloquium Method (http://www.designedinstruction.com/learningleads/investigation-colloquium.html) and Teacher Questioning Tips: Effective Techniques for Mediating Dialogic Talk (http://www.designedinstruction.com/learningleads/teacher-questioning-tips.html).

Is adaptable. During both immediate follow-up and deeper analysis, there are limitless options to address students' critical analysis skills (e.g., comparing and contrasting, drawing inferences, predicting, employing and distinguishing between inductive and deductive logic and/or extrapolation and interpolation, organizing and mapping ideas, and so on). Teachers may choose to take these as they arise, or even specifically address certain skills that standardized test scores indicate as problem areas.

Is inconclusive. It's *not over* when a prompt is employed. Whether it is used at the outset of a study or in an assessment, a prompt is always *generative*, and must be followed up, or it loses its most valued quality.

Is illustrative of the nature and philosophy of a study. A prompt that is accompanied by proper discussion and follow-up will almost always reveal epistemological aspects—in the used in this document, for example, *how* we study science and history. We should discuss with students the meaning of an

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operational question, and how the types of observations they have just made often help us to establish operational questions that can guide our investigations as we attempt to learn more about a topic. Illustrate the point by referring to several of the questions students have posed during discussion of the observations. Point out that often their initial observations help them to get a basic sense of some general principles at work (e.g., light bending as it passes through a transparent surface, economic conditions causing social ills, and so forth). Introduce the reasoning behind establishing a *controlling idea* to assist us in forming operational questions to guide and structure deeper investigation or research into a particular topic.

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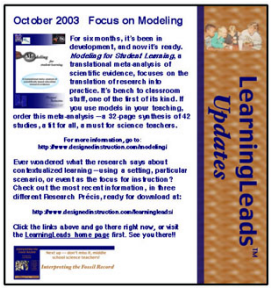

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