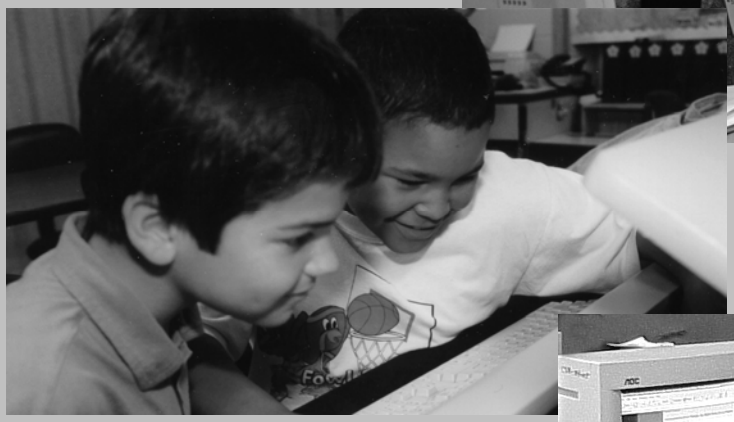
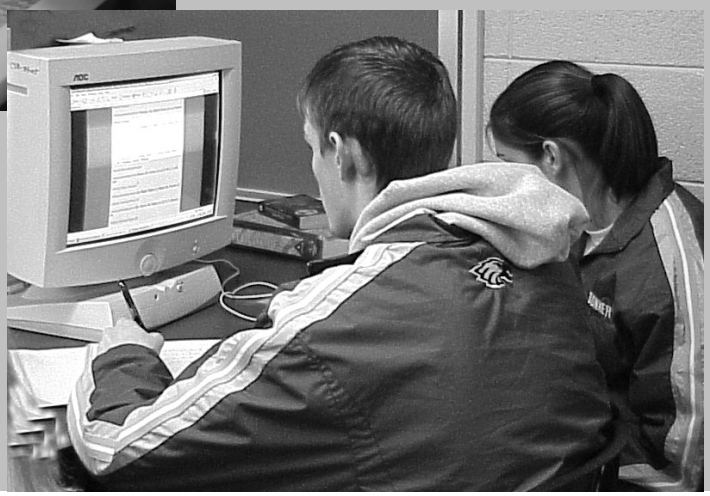
Essential Questions and Questioning Strategies





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Essential Questions and Questioning Strategies

eMINTS National Center
103 London Hall
Columbia, MO 65211
Voice: (573) 884-7202 Fax: (573) 884-7614
www.emints.org

Cover Photos:
Brian Kratzer

Contributors:
Roxanne Kerwood

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Purpose of the Module

In an inquiry-based lesson, questions form the foundation of student learning. Creating a classroom environment where students learn to ask good questions and know how to organize questions to guide inquiry can produce opportunities for the students to construct meaning and deep understanding from inquiry. This session introduces participants to multiple types of questions and some ways to anchor inquiry with essential questions.

Module Objectives

- Learners will understand the importance of fostering a classroom culture that values student questions.
- Learners will use a variety of question types to elicit higher level thinking in students during discussions.
- Learners will understand essential questions and will develop essential questions to guide student inquiry.

Importance of Questions

Students generally encounter questions in the classroom as part of teacher-led discussions or as a means of teacher-directed assessment following instruction. Questions from the teacher during instruction often guide student thought or check student recall of content previously covered. If students pose questions, they are typically to clarify information presented by the teacher. Questions posed to students as a follow-up to instruction or for assessment typically probe for information recall.

Employer expectations for employees in the twenty-first century are changing. Today's students must possess the ability to solve problems, make decisions and think creatively to succeed in tomorrow's workplace. To meet these demands, students must be able to ask the types of questions that will serve as springboards to inquiry and critical thinking. Good questions provide the basis for inquiry into real-world problems and decisions. Through inquiry into authentic problems, students can develop the skills they need to meet curriculum standards and to function in the workplace. Teachers who understand how to shift the balance of questions from themselves to their students, who can help their students ask probing questions that lead to meaningful inquiry, will produce learners who can meet twenty-first century workplace expectations.

Classroom Culture

Culture in the context of the workplace encompasses the shared values, attitudes, goals and practices of a company or corporation (Merriam-Webster, http://www.merriam-webster.com/cgi-bin/dictionary?book=Dictionary&va=culture). The patterns and priorities for conducting business set by a specific group of people determine the culture of an organization. If a company values high-quality customer satisfaction, their attitudes, goals and practices will demonstrate this value. People within the company will go the extra mile to make sure a customer is satisfied. If a company values problem-solving and creative thinking, its daily operations and business priorities will reflect these values.

How Does This Idea Apply to the Classroom?

Classroom communities each have a culture. Daily operations, expectations and attitudes reflect classroom values, the culture of the classroom community. John Barell, author of *Developing More Curious Mind*s, states, "There are patterns within our separate classrooms. There are ways of going about our business, and there are also feelings and attitudes that we communicate to students. These patterns and attitudes or dispositions add up the central core values or priorities of the classroom culture. In a classroom where curiosity is valued most highly and where explorations of new territories like the World Wide Web will be commonplace, there need to be some changes in our behavior" (2003).

If a classroom environment fosters, encourages and values questioning, students will feel comfortable taking risks and asking questions. Students will not worry about whether or not their questions have value but will realize that all questions contribute to the quest for knowledge and are integral to learning. Students will ask questions without hesitation.

In classrooms that value questioning, students become active learners and think deeply as they develop and refine their questions, rather than waiting for someone to tell them about the topic or ask them simple recall questions. When students wonder, ponder or reflect about something, they are engaged in learning. When students sit and listen to a teacher tell them about a topic, students are passive learners. Active learners have to wrestle with meaning to develop understanding and will retain what they learn. Passive learners comprehend information as someone presents it to them, but to retain it they must feel motivated to apply the information or connect it to previous knowledge.

For example, reflect a moment on a personal experience that raised questions about a circumstance or problem and was followed by the quest for an answer. People facing health issues, the loss of a loved one or a significant career change often ask many deep and probing questions. Consider how well the answers to such questions remain in long-term memory. Compare this learning experience to a situation in which someone provided information during a lecture.

Fostering a Classroom Culture that Values Questions

Teachers can use a number of strategies to encourage students to ask good questions and to foster a classroom culture that values questions. Employing these strategies in the classroom will help students develop positive attitudes toward questioning and, over time, will make asking good questions easier and more routine for students. They will feel comfortable taking risks and asking questions. Barell offers the following strategies.

Set High Expectations

The expectations of parents and teachers influence student outcomes. Take, for example, the following quotation from Nobel Prize physicist Isidor Isaac Rabi. “My mother made me a scientist without ever intending to. Every other Jewish mother in Brooklyn would ask her child after school, ‘So? Did you learn anything today?’ But not my mother. ‘Izzy,’ she would say, ‘did you ask a good question today?’ That difference —asking good questions—made me become a scientist” (http://www.quotegarden.com/science.html). Rabi’s mother fostered a culture that valued questions because she clearly communicated to her son her expectation that he ask good questions. When teachers expect students to ask good questions and clearly communicate this expectation, students will understand that asking questions has value and will meet these expectations.

Learning what constitutes a good question that will lead to knowledge is an important element in developing a culture that fosters questioning. Some questions will open the doors to inquiry and some questions will not. Teaching students to categorize questions based on specific criteria helps them learn to refine their questions and to understand what makes a good question.

To help students learn how to ask good questions, first record questions on a SMART Board, white board or chart paper. Then categorize the questions based on the type of response the question will elicit. Sort for questions that will elicit recall or the retelling of information, as well as questions that require inference, analysis or the synthesis of

multiple sources and types of information. Consider grouping the retelling or recall questions with the inference questions they support. For example, to answer the question, "Is global warming real or just hot air?" students will need to ask retelling questions about existing knowledge.

Develop Positive Scripts

Developing habits of mind where students naturally ask questions and are curious promotes a classroom culture that encourages inquiry. When students hear teachers ask questions aloud, the questioning strategies modeled by the teacher become mental habits for students. When teachers model certain types of questions aloud in front of students on a routine basis, the questions become positive scripts or examples that students will begin to use in their own thinking. Barell suggests the following question stems as examples for students (2003):

- What I am curious about is…
- What I do not yet understand is…
- I really want to find out about…
- The mysteries and puzzles that really intrigue me are…
- If I could be somebody else...or visit another time period, this is what I'd want to discover…
- I really wonder why…
- What intrigues me is...

In addition, Barell proposes the following two questions as a means of probing deeper: "How do you know? How do they know?" Challenge students by letting them know the classroom expectations are that they communicate their thinking, rather than providing one- or two-word answers (2003).

Model Strategies Used by Field Professionals

Professionals use certain lines of questions to approach various circumstances. Mathematicians approach a complex problem with questions that help them clarify and define the problem. The questions these professionals ask drive their inquiry. Model the questioning strategies historians or mathematicians use when they approach problems. Consider confronting students with authentic, problematic situations similar to those situations experienced by professionals in the field. This process will stimulate student curiosity and offer students the opportunity to experience firsthand the questions professionals use as they approach problems (Barell, 2003).

Encourage Quality Peer Interaction

Much of the dialog in classrooms during instruction occurs between the teacher and a student. Encouraging students to respond to each other with questions, as opposed to just the teacher, promotes inquisitiveness. "It is peer interaction within the classroom that can not only foster and develop more inquiry, but it can also generate high quality problem solving and decision making and, therefore, deeper understanding of complex issues" (Johnson & Johnson, 1979).

In some classrooms teachers foster peer interaction by providing students with scripted response stems as a method for teaching students how to respond to each other during a discussion. For example, when Tom has a question about Judy's statement, Tom responds with the following stem, "I understand what Judy is saying, but I wonder…" When working with older students, the importance of an open culture becomes even more important. Techniques for helping older students work with

scripted response stems involve more teacher modeling and open discussion of the value of using the stems.

To further encourage quality peer interaction, have students work in cooperative groups on real-world problems and situations. Depending on the students' level of peer-interaction skills, it may be necessary to model this type of interaction for students so they develop the skills needed to interact appropriately during small-group discussions.

Multiple Question Types

Good questions engage students, guide the inquiry process and do more than just require an answer: they stimulate curiosity and thought. "A good question reflects a genuine desire to find out, a deep feeling for wanting to know more than we already do" (Barell, 2003). Many types of questions qualify as good questions, especially if they lead to hypothetical thinking, reflection, hunches or inquiries that help students plan investigations. Learning to generate different types of questions for different purposes helps students learn to ask questions that lead to knowledge and understanding. Becoming familiar with the type of thinking or processing a question requires helps students plan and progress through the search for an answer. For example, when students understand that answering an inference question requires looking beyond the information given, they will not spend time looking for an explicit text-based answer to that kind of question.

Jamie McKenzie identifies seventeen different types of questions like the following: overarching, big-idea questions, such as **essential questions**; questions that refine or illuminate answers to essential questions, such as **subsidiary questions**; questions that lead directly to specific information, such as **telling questions**; and questions that help students refine their investigation processes, such as **planning questions, organizing questions** and **probing questions**. McKenzie explains each type of question in his book *Beyond Technology: Questioning, Research and the Information Literate School* and in an online article available at the following website: http://www.fno.org/nov97/toolkit.html. To guide students in their use of different types of questions, McKenzie suggests teachers post a questioning toolkit in the form of a matrix to which students can refer. Each cell of a questioning-toolkit matrix can contain a different type of question. As students embark on an investigation, they refer to the toolkit of questions to guide them as they develop their inquiries.

In the article, "The Art of Questioning," Dennis Palmer Wolfe identifies five types of questions: **inference**, **interpretation**, **hypotheses**, **transfer** and **reflection**. Wolfe suggests that these types of questions foster higher level thinking and that when teachers pose a variety of such question types in a questioning arch, "they pursue an investigation in which simple factual inquiries give way to increasingly interpretive questions until new insights emerge." An arch of questioning happens in an exchange between a student and teacher when the teacher uses a variety of question types to guide the student into digging deeper into thought to produce new insights. This type of questioning directly contrasts with questioning strategies in which the teacher poses multiple questions aimed at producing recall and factual answers from students or checking student understanding.

In *Developing More Curious Minds*, Barell identifies three types of questions: **gathering, process** and **application**. Students can answer **gathering** questions by accessing information from resources. **Process** questions involve inference and analysis. They ask for similarities and differences, comparisons and hypotheses. **Application** questions involve using knowledge to develop answers. They include hypothetical "What if..." questions.

Students do not need to know all the different types of questions; teachers, however, do need to know all the different types of questions. They need to know how to help students learn to use the different types of questions in the inquiry process. Students should understand that **telling** or **gathering** questions require looking for specific information in texts, charts or figures, and **process** or **inference** questions require looking at the information available and creating answers based on what they know.

Questions Driving Inquiry

The word inquiry implies searching to find answers to questions. Inquiry-based learning is driven by student-generated questions. Teachers face the challenge of designing units and lessons that both meet curriculum standards and are developed in such a way that student-generated questions guide the investigations. As a necessary first step in meeting this challenge, teachers need a thorough knowledge of the curriculum standards for which they are responsible. With this information in place, they can easily guide students toward the desired goals. Engaging students in the process of inquiry begins with an authentic problem or situation and thought-provoking questions, all of which relate to curriculum standards. The process continues with students generating multiple types of questions, followed by a quest for answers. In this quest students wrestle with meaning and develop deep understanding of concepts and principles. All while the teacher carefully monitors student work to ensure that the curriculum standards are being met as the inquiry process unfolds. Gentle redirection may be necessary to meet curricular goals by guiding students into the most important areas of study.

Engaging Students to Elicit Questions

In order for students to create good questions that can serve as a sound basis for inquiry, they must be motivated or engaged in a situation. Teachers can use any of several strategies to engage or hook students into generating good questions.

Ask Overarching Questions

Organizing instruction around overarching questions engages students in the process of inquiry. These questions open doorways for students to ask additional questions and engage them in uncovering important ideas. Many sources refer to overarching questions as essential questions. The next section of this module will cover essential questions in more depth.

Create Dissonance

Jamie McKenzie suggests creating dissonance by posing differing options or situations side by side or presenting situations that are unusual, troubling or contrary to what students may normally have encountered. McKenzie states that by presenting situations in this manner, "We are thrown off balance. Our minds are intrigued, our

curiosities awakened. We want to resolve the dissonance, bring things back into harmony and resonance" (2000).

Find Authentic Situations

Posing an unusual or problematic situation, circumstance or object can engage students and elicit questions. According to Barell, "This is what gets us started asking questions: some occurrence, observation, or encounter that seems strange, puzzling, or somehow perplexing to our way of understanding the world. These doubts, difficulties, and uncertainties create questions in our minds" (2003).

Essential Questions

Essential questions go to the heart of a topic or subject. They are the type of questions people ask over and over. They lead to higher level thinking and cannot be answered with a single word or statement. They do not have obvious right answers. They spark curiosity and sense of wonder and suggest investigation and inquiry. Essential questions probe for deeper meaning and understanding. All other questions, such as subsequent, subsidiary or guiding questions, point to a possible answer for an essential question (McKenzie, 2000; Wiggins & McTighe, 2001; Jacobs, 1997). The purpose of an essential question is "to frame the learning, engage the learner, link to more specific or more general questions, and guide the exploration and uncovering of important ideas" (Wiggins & McTighe, 2001).

Essential questions form the heart of an inquiry-based lesson or unit and should closely relate to the curriculum standards for the students' grade level(s). When students work to create answers to essential questions they develop deep understanding of a topic by uncovering the most important ideas related to the topic, thus ensuring their mastery of the curriculum involved.

Consider posing an essential question to students as the initial hook or introduction to a lesson or with background information such as an authentic problem, situation or object. In some instances, students may benefit from introductory questions, questions that capture their interest and lead to an overarching question, prior to taking up an essential question.

Developing Essential Questions

To develop essential questions, teachers often need to dissect curricular content to determine the most important understanding students should gain from their inquiry. Basic skills and knowledge written in the form of a question do not amount to an essential question. For example, the question, "What are the three branches of government?" is not an essential question. The following questions about government are essential questions: "What is the role of government?" Does government serve people? How is democracy of the people, for the people and by the people?"

When writing essential questions consider the following criteria:

- Use language that all students will understand.
- Base the question on overarching ideas or problems.
- Write the question in a way that will engage students in wanting to know more.
- Develop a question for which no single right answer exists.

- Write the question so it involves thinking, not just answering. Have it require students to construct an answer by applying their research, not just looking up a textual answer.
- Base the question on upper levels of Bloom's Taxonomy.

Subsequent, Subsidiary or Guiding Questions

Subsequent, subsidiary or guiding questions need to be more pointed than essential questions. They share some characteristics with essential questions, as they do not necessarily have single answers and are often open-ended, but these questions lead back to and help answer essential questions. They help students make explicit connections to curriculum standards and content expected at their grade level or in a particular subject area. Jamie McKenzie defines subsidiary questions as "questions that combine to help us build answers to our Essential Questions. Big questions spawn families of smaller questions that lead to insight . . . the more skillful we and our students become at formulating and then categorizing subsidiary questions, the more success we will have constructing new knowledge" (2000).

Students can generate subsequent questions after they have encountered the essential question and/or problem, situation or object that hooks them into wanting to know more. The teacher can record subsequent questions on the SMART Board, whiteboard or chart paper by creating lists of questions based on various question types or through brainstorming sessions in which every question that comes to mind is written down.

After recording subsequent questions, the teacher needs to guide students into organizing their questions so they can begin an investigation with a clear plan. Clear investigative plans prevent students from spending time wandering aimlessly through information looking for single factual answers. When organizing questions, students need to identify which questions they can answer directly by looking up information and which questions will require the use of analysis, synthesis or evaluation.

Organizing questions gives both the teacher and the students a clear guide toward the eventual assessment of the investigation and any resulting products. Students will know from the beginning the criteria that will be used to evaluate their work and the understandings for which they will be responsible. Teachers and students can then design assessments that focus on the products in a way that validates learning rather than engenders anxiety.

Practice

Identify specific steps to take toward fostering a classroom culture in which students will ask good questions. Consider how students will become familiar with different types of questions. Review the list of standards and curriculum topics teachable using constructivist principles powered by technology (developed during the constructivism session). Identify overarching ideas and write essential questions.

Describe some possibilities, consistent with constructivist principles, for assessing student understanding of the different types of questions.

Resources

Books

Barell, J. (2003). *Developing More Curious Minds*. Alexandria, VA: Association for Supervision and Curriculum Development. Select chapters online as follows: http://www.ascd.org/portal/site/ascd/template.book/menuitem.ccf6e1bf6046da7cdeb3ffdb62108a0c/?bookMgmtId=30fd177a55f9ff00VgnVCM1000003d01a8c0RCRD.

Hayes Jacobs, H. (1997). *Mapping the Big Picture*. Alexandria, VA: Association for Supervision and Curriculum Development.

McKenzie, J. (2000). *Beyond Technology: Questioning, Research and the Information Literate School*. FNO Press.

Wiggins, G. & McTighe, J. (2001). *Understanding by Design*. Upper Saddle River, NJ: Prentice-Hall, Inc.

Future Skills

21st Century Skills
http://www.21stcenturyskills.org/downloads/P21_Report.pdf

Skills and Competencies Needed to Succeed in Today's Workplace
http://www.ncrel.org/sdrs/areas/issues/methods/assment/as7scans.htm

Questioning

A Questioning Toolkit
http://www.fno.org/nov97/toolkit.html
Jamie McKenzie's description of 17 different types of questions and the goal for each type.

Questioning as Technology
http://www.fno.org/apr03/qtech.html
Part I explores the importance of student-generated questions in the classroom. Part II discusses the development of classroom culture in which students readily ask questions.

The Question Mark
http://questioning.org/
An educational journal devoted to questions, questioning, sound intelligence, strategic reading and quality teaching.

Filling the Toolbox
http://www.fno.org/toolbox.html
An article that details instructional strategies in which students ask questions to guide inquiry.

The Art of Asking Good Questions
http://www.youthlearn.org/learning/teaching/questions.asp

Essential Questions

Teaching for Understanding: The Importance of Essential Questions, Montana Heritage Project
http://www.edheritage.org/HE_02aut/essentialquestions.htm

Essential Questions by New Mexico State University
http://mathstar.nmsu.edu/exploration1/unit/content_questions.html

Biopoint: Using the Internet to Promote Inquiry-based Learning
http://www.biopoint.com/ibr/essential_question.htm
Essential Questions.

Framing Essential Questions by Jamie McKenzie
http://www.fno.org/sept96/questions.html

Creating Essential Questions
http://www.galileo.org/tips/essential_questions.html

Transforming Standards to a Big Idea and Essential Questions
http://magnet.sandi.net/workshops/informationquest/essential.html