The Art of Questioning

# Classroom Questions - Types Of Questions, Feedback, Effective Questioning Practices

When people really want to learn something, they ask questions. They ask questions to become skilled in using new software, or to figure out the norms of courtesy in another culture, or to master the fine art of parking a car. It is not surprising that for many, questioning is at the very heart of learning, the central skill in the teaching-learning process. Teachers have been described as "professional question-askers," and history records great teachers such as the Greek philosopher Socrates in terms of their unique questioning skill.

Questions can and have been used for a wide variety of educational purposes: reviewing previously read or studied material; diagnosing student abilities, preferences, and attitudes; stimulating critical thinking; managing student behavior; probing student thought process; stirring creative thinking; personalizing the curriculum; motivating students; and assessing student knowledge. The many uses of questions as described by Sari Rose and John Litcher, as well as the relative ease in recording and analyzing their use in the classroom, has led to extensive research of classroom questions. In 1912 Rommiett Stevens observed classroom life and the use of questions. She unearthed the fact that teachers were involved in a high frequency of question asking, asking approximately 395 questions each day. The majority of these questions, about two out of three, were asked at a low intellectual level, usually requiring little more than rote memory and recall. And they were asked not by the student, the person at the center of learning, but by the teacher. Reviews of research in the United States, the United Kingdom, Germany, and Australia, as well as in many developing nations, have shown similar results. To a great extent, teaching means talking and asking questions, and learning means following directions and answering questions. Much of the current research and teacher education has focused on altering these findings, and creating more challenging and meaningful classroom questions.

## Types Of Questions

One of the first directions for improving the quality of classroom questions was determining the intellectual level of teacher questions. Broadly conceived, content-or subject-related questions were grouped into two cognitive categories: lower order, for memory, rote, and simple recall; higher order, for more demanding and exacting thinking. The preponderance of lower-order questions was troublesome to educators, for it contradicted the notion of a thoughtful classroom, promoting important if not profound student insights. As a result, educators developed a number of classification systems to categorize question levels, the first step in promoting the use of more demanding questions in the classroom. Mary Jane Aschner and James Gallagher developed a widely used system that created four divisions, ranging from simple recall to more difficult thought, to creative thinking, and finally to evaluative thinking. In fact, numerous such systems have been devised, but none more influential than Benjamin Bloom's taxonomy.

In 1956 Benjamin Bloom headed a group of educational psychologists engaged in identifying the levels of intellectual behavior important in learning. The taxonomies they developed included three overlapping domains: the cognitive (intellectual), psychomotor (physical), and affective (attitudes and emotions). Each taxonomy is an organizational strategy in which lower categories are subsumed in higher ones. In the cognitive domain, knowledge, the lowest level in Bloom's taxonomy, must be mastered before comprehension, the second level, can be attempted. In fact, comprehension is an intellectual process that uses knowledge. These six levels have been adapted in formulating school goals, assessing learner progress, and developing questions. Bloom's six cognitive levels range from simple recall or recognition of facts through increasingly more complex and abstract intellectual tasks. The following brief definitions are followed by several sample verbs that reflect the appropriate intellectual activity:

1. Knowledge: Requires that students recognize or recall information. Remembering is the key intellectual activity. (define, recall, memorize, name, duplicate, label, review, list, order, recognize, repeat, reproduce, state)
2. Comprehension: Requires that students demonstrate sufficient understanding to organize and arrange material mentally; demands a personal grasp of the material. (translate, explain, classify, compare, contrast, describe, discuss, express, restate in other words, review, select)
3. Application: Requires that students apply information, demonstrate principles or rules, and use what was learned. Many, but not all, educators believe that this is the first of the higher-level thought processes. (apply, classify, solve, use, show, diagram, demonstrate, record, translate, illustrate, choose, dramatize, employ, operate, practice, schedule, sketch, write)
4. Analysis: Educators agree that this and all the following categories require higher-level thinking skills. Analysis requires students to identify reasons, uncover evidence, and reach conclusions. (identify motives and causes, draw conclusions, determine evidence, support, analyze, deduce, categorize, compare, contrast, criticize, differentiate, justify, distinguish, examine, experiment)
5. Synthesis: Requires that students perform original and creative thinking. Often many potential answers are possible. (write or arrange an original composition, essay or story, make predictions, solve problems in an original way, design a new invention, arrange, assemble, collect, compose, construct, create, design, develop, formulate, manage, organize, plan)
6. Evaluation: Requires that students judge the merit of an idea, solution to a problem, or an aesthetic work. These questions might also solicit an informed opinion on an issue. (judge, value, evaluate, appraise, argue, assess, attach, choose, compare, defend, estimate, rate, select)

While Bloom's taxonomy has facilitated gauging the level of teacher questions, sorting out the significance of these levels is more problematic. A meta-analysis of higher-order questions by Gordon Samson, Bernadette Strykowski, Thomas Weinstein, and Herbert Walberg, among others, demonstrated only a weak link between higher-order question asking and higher-order thinking. Other researchers have discovered that lower-order questions can be as effective as higher-order ones. Factors such as student background, curricular goals, and the skill of the teacher can be influential in determining which level of question is most effective. Studies suggest that teachers may be more skilled in asking lower-order questions, that curricular goals stressing mastery and memory of content may be achieved more efficiently with lower-level questions, and that many lower-socioeconomic class students seemed to perform better with lower-level questions than higher-order ones. Other studies indicate that even when a teacher asks a higher-order question, students may answer at a lower level. The clarity and specificity of the teacher's question and the background knowledge of students are two reasons why higher-order questions may elicit lower-level responses. Determining what steps educators can take to promote more sophisticated and challenging student thought processes is a central concern of future research.

Beyond the taxonomy, William Wilen and other researchers have categorized several types of questions. Probing questions are follow-up questions asked after a student responds to the initial question. Probing questions require a student to think deeper than the original response, and to integrate new material. One type of probing is the Socratic question, which originated with the Greek philosopher whose skillful inquiry helped students recognize gaps and contradictions in their understanding. Teachers sometimes structure questions specifically for the purpose of diagnosing a student's needs and for bridging a learning gap, a questioning strategy called *scaffolding.* The term derives from the construction industry, where scaffolding is used to support a notyet-completed building. Divergent questions often provide unique student insights, encourage the exploration of many possibilities, and do not produce a single correct answer. Affective questions concern attitudes, values and feelings of students, and although they reside in another domain, they are related to the levels described in the cognitive taxonomy. Defining and categorizing types of questions will likely continue in the years ahead.

## Feedback

Teacher responses to student answers, often termed *feedback,* represent another rich area of educational research and training. The most common teacher response is neutral acknowledgement, simply accepting a student response in silence or with minimal recognition. Educators John Goodlad, Theodore Sizer, and others have characterized the typical classroom intellectual climate as bland and unchallenging, and the preponderance of both lower-order questions and simple acceptance reactions from teachers undoubtedly contribute to this lackluster atmosphere. While teachers sometimes provide active help correcting and improving student responses, praise and criticism occur infrequently.

The silent time before feedback is given, a period called *wait-time,* has also been an important topic of investigation. Thomas Good and Jere Brophy have reported on the research of Mary Budd Rowe and others concerning two wait times in the questioning cycle. Wait-time I is the silent period that follows a teacher question but precedes the next utterance, typically a student answer or an additional teacher comment. Wait-time I can be thought of as "think" time, and if wait-time I is long enough, students have adequate time to volunteer to answer a question, as well as to think about the answer that they will give. Wait-time II, the second critical silent period, follows a student answer but precedes a teacher reaction. If wait-time II is long enough, both students and the teacher can carefully consider student responses. Unfortunately, research shows that wait-times I and II are rarely long enough for thoughtful classroom interactions, each typically less than one second in duration. Studies show that if wait-time I is increased to three to five seconds following a higher-order question, a number of positive results follow. Longer wait-time I leads to a higher rate of student participation, longer, more correct and more complete answers, higher achievement, and more on-task student talk. In addition, longer wait-time can attract low-participating learners into class interactions. Students with limited English proficiency, minority students, lower-achieving students, and females are typically among those who benefit from a longer wait-time. While wait-time II is less well known to educators, it is also important. By extending the silent period after a student response, teachers give students the opportunity to complete their answers and to build on each other's ideas. A longer wait-time II also gives teachers time to carefully consider student answers, and to formulate a more precise and helpful reaction to those answers.

Increased wait-time has also been linked to an increase in student-initiated questions. When children are young, their vocabulary is characterized by a high number of questions. In schools, however, children rarely formulate content-related questions on their own. It is ironic that although one typically links learning with asking questions, it is the teacher, not the learner, who is doing the asking. When students ask questions, they are typically procedural ("Will this be on the test?") or express confusion or lack of understanding of content. Research indicates that when students generate their own questions, their comprehension of a topic is enhanced. Although Barak Rosenshine, Carla Meister, and Saul Chapman have described several successful strategies in promoting student initiated questions, most classrooms have a dearth of such questions.

## Effective Questioning Practices

William Wilen, Margaret Ishler, and Janice Hutchinson, among others, have synthesized the research on effective questioning techniques and suggested several helpful directions for teachers:

1. Effective questions are clearly phrased, reducing the possibility of student confusion and frustration. A major problem occurs when a teacher asks a series of run-on questions, while attempting to sharpen the focus of the original question.
2. Teachers should wait at least three to five seconds after asking a question that requires higher-order thinking (wait-time I), and three to five seconds after a student response to provide precise feedback (wait-time II).
3. Effective teachers encourage all students to respond, rather than depending on volunteers, or answering the question themselves. Longer wait time, probing questions, and a pattern of expectation for student responses are all helpful strategies in promoting student responses.
4. The research on student call-outs suggests that although call-outs need to be controlled, their response can be a helpful technique in promoting student participation among reticent and low-socioeconomic students.
5. The research on the effectiveness of higher-level teacher questions, those questions on Bloom's taxonomy that require analysis, synthesis or evaluation, is mixed. However, the consensus is that higher-level questions encourage higher-level student thinking.
6. Teacher feedback should be specific and discriminating. Students should be acknowledged for their contribution, praise should underscore genuine accomplishment, while criticism and remediation should point out areas in need of improvement (focusing on the behavior, skills, and knowledge, rather than the individual).
7. While researchers consider the frequency of teacher questions (well into the hundreds a day) as too high, there is an increasing emphasis on the need to encourage more student-initiated questions–an indication of student involvement and increased student comprehension.

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<http://www.teachervision.fen.com/teaching-methods/new-teacher/48445.html>

<http://guroako.blogspot.com/2011/03/blooms-taxonomy-key-words-in-art-of.html>

### Bloom's Taxonomy : Key Words in the Art of Questioning

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| **Students must develop Higher Order Thinking Skills (HOTS) .** |

       Teachers should be masters in the art of questioning. One of the ways in attaining this is by using Bloom's Taxonomy in classifying learning objectives. Asking questions in different levels can help students to develop Higher Order Thinking Skills (HOTS).   
  
Level 1 :  Knowledge= shows previously learned concepts by recalling facts, terms, basic concepts and answers.  
  
Key words: who, what, why, when ,omit, where, which, choose, find, how, define, label, show, spell, list, match, name, relate, recall, select  
  
Questions :    
What is...?  
How is...?  
Where is ... ?  
When did \_\_\_\_\_\_\_\_ happen?  
How did \_\_\_\_\_\_\_\_ happen?   
How would you explain?  
Why did ...?  
How would you describe ... ?  
When did ... ?  
Can you recall ... ?  
How would you show ... ?  
Can you select ... ?  
Who were the main ... ?  
Can you list three ... ?  
Which one ... ?  
Who was ... ?

Level 2 :  Comprehension= exhibiting understanding of facts and ideas by organizing, comparing, translating, interpreting, giving descriptions and stating main ideas.

Key words: compare, contrast, demonstrate, interpret, explain, extend, illustrate, infer, outline, relate, rephrase, translate, summarize, show, classify

Questions :

How .... ?

Which ... ?

How would you classify the type of ... ?

How would you compare ... ? contrast ...  ?

Will you state or interpret in your own words ... ?

How would you rephrase the meaning... ?

What facts or ideas show ... ?

What is the main idea of ... ?

Which statements support ... ?

Can you explain what is happening ... what is meant?

What can you say about ... ?

Which is the best answer ... ?

How would you summarize ... ?  
  
Level 3 :  Application=solving problems by appying acquired knowledge, facts, techniques, and rules in a different way

Key words: apply, build, choose, construct, develop, interview, make use of, organize, experiment with, plan, select, solve, utilize, model, identify

Questions :       How many ... ? Which... ? What is ...? Write an example of ... ?

How would you use .. ?

What examples can you find to  .. ?

How would you solve \_\_\_\_\_\_ using what you have learned ... ?

How would you organize \_\_\_\_\_\_ to show ...?

How would you show your understanding of ... ?

What approach would you use to ... ?

How would you apply what you learned to develop ... ?

What other way would you plan to  ... ?

What would result if ... ?

Can you make use of the facts to ... ?

What would result if  ... ?

Can you make use of the facts to ... ?

What elements would you choose to change... ?

What facts would you select to show ... ?

What questions would you ask in an interview with \_\_\_\_\_ ?

Level 4 :  Analysis=examining and breaking information into parts by identifying motives or causes;  making inferences and finding evidence to support generalizations.

Key words: analyze, categorize, classify, compare, contrast, discover, dissect, divide, examine, inspect, simplify, survey, take part in , test for, distinguish, list, distinction, theme, relationships, functions, motive, inference, assumption, conclusion

Questions :       Why ... ?

What are the parts of features of  ... ?

How is \_\_\_\_\_\_\_\_\_\_ related to  ... ?

Why do you think... ?

What is the theme ...?

What motive is there ... ?

Can you list the parts ... ?

What inference can you make ... ?

What conclusion can you draw  ... ?

How would you classify... ?

How would you categorize ... ?

Could you identify the different parts... ?

What evidence can you find ... ?

What is the relationship between... ?

Can you make a distinction between... ?

What is the function of \_\_\_\_\_ ?

Which ideas justify .. ?

Level 5 :  Synthesis=compiling information together in a different way by combining elements in a new pattern or proposing alternative solutions

Key words: build, choose, combine, compile, compose, construct, create, design, develop, estimate, formulate, imagine, invent, make up, originate, plan, predict, propose, solve, solution, suppose, discuss, modify , change, original, improve, adapt, minimize, maximize, delete, theorize, elaborate, lest, improve, happen, change

Questions :       How can we improve ... ? What would happen if ... ? How can we solve ... ?

What changes would you make to solve  ... ?

How would you improve ... ?

What would happen if... ?

Can you elaborate on the reason  ...?

Can you propose an alternative ... ?

Can you invent ... ?

How would you adapt \_\_\_\_\_\_\_ to create a different ... ?

How could you change (modify) the plot (plan) ... ?

What could be done to minimize (maximize)... ?

What way would you design ... ?

What could be combined to improve (change)... ?

Suppose you could \_\_\_\_\_\_\_\_\_\_\_ what would you do ... ?

How would you lest... ?

Can you formulate a theory for... ?

Can you predict the outcome if .... ?

How would you estimate the results for .. ?

What facts can you compile ... ?

Can you construct a model that would change ... ?

Can you think of an original way for the  ... ?

Level 6 :  Evaluation=presenting and defending opinions by making judgments about information, validity of ideas or quality of work based on  a set of criteria.

Key words: award, choose, conclude, criticize, decide, defend, determine, dispute, evaluate, judge, justify, measure, compare, mark, rate, recommend, rule on, select, agree, interpret, explain, appraise, prioritize, opinion, support, importance, criteria, prove, disprove, assess, influence, perceive, value, estimate, influence, deduce

Questions :       What do you think of ... ? How do you feel about ... ? What is your opinion of ... ?

Do you agree with the actions ... ? with the outcomes ... ?

What is your opinion of ... ?

How would you prove ... ? disprove ... ?

Can you assess the value or importance of ... ?

Would it be better if ... ?

Why did they (character) choose ... ?

What would you recommend ... ?

How would you rate the ... ?

What would you cite to defend the actions ... ?

How would you evaluate ... ?

How could you determine ... ?

What choice would you have made ... ?

What would you select ... ?

How would you prioritize ... ?

What judgment would you make about ... ?

Based on what you know, how would you explain ... ?

What information would you use to support the view ... ?

How would you justify ... ?

What data was used to make the conclusion ... ?

Why was it better that  ... ?

How would you prioritize the facts ... ?

How would you compare the ideas ... ? people.. ?