

FEATURED ARTICLE

Questiology, or the Art of Questioning

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Introduction

In a classroom questioning study, Stevens (1912) stated that approximately eighty percent of teachers' class time was spent asking questions directed towards their students. In another study, Graesser & Person (1994) found out teachers ask between 300 and 400 questions a day. The results, then, are revealing. They showcase that questioning is the most common tool used in teaching. Given that, for teaching to be efficacious, teachers are requested to plan questions that not only reinforce students' understanding but lead them to higher order thinking, connect their prior knowledge to new acquired one.

Indeed, if properly used and purposefully designed questioning can be a tremendous tool to improve teaching and learning. Unfortunately, many of teachers' questions are of low level cognitive nature. They are mainly based on recalling information rather than stimulating thought or fostering a deeper understanding of a concept. To engage students in the process of learning, teachers need to approach questioning from a new perspective: adopt more high level types of questions that would require students move from memorizing and recalling to applying, analyzing, evaluating, and synthesizing. With a general consensus in mind that questioning is an important component in teaching and a leading vector towards critical thinking, this paper will attempt to bring answers to wh-how questions about

questioning, highlights the importance of designing and asking effective questions.

Defining effective questioning

Questioning is a useful way to aid in the transfer of knowledge from instructor to student (Ross, 1860); therefore, they are a powerful tool to generate and promote learning. Teachers' questioning based on Asking- Eliciting answer formula does neither promote effective teaching nor does it lead to deep thinking on the part of the students. Eliciting answers to "what", "where", and "when" should be lessened to give place to the "why" and "how" questions. Posing questions that require high order thinking develops critical thinking faculty in students and challenges their deeper understanding of a concept as asserted by Croom and Stair (2005).

The importance of asking effective questions:

The world of today needs individuals who are capable of dealing with new situations, solving problems and thinking critically rather than individuals capable of recalling information. Research on questioning suggests that teachers spend half of their class time asking questions (Cotton, 1988). Given that questions generated by teachers are indicators of teaching quality (Carlsen, 1993; Smith, Blakeslee, & Anderson,

1993), and that teachers spend half of their class time asking questions (Cotton, 1988), questions asked in class should be thought provoking to make students work within their zone of proximal development (see figure 1). Well-designed questioning increases class participation with students expressing their views on how to deal with their world and their lives not only in schools but outside schools' setting as well. Being a very valuable learning tool, well designed questions offer several other benefits:

- ✓ They engage students with the learning;
- ✓ They assess what has been learned;
- ✓ They initiate individual/ collaborative thinking in response to new information;
- ✓ They provide an opportunity for students to express their opinions;
- ✓ They challenge the level of thinking;
- ✓ They provide opportunities for student learning through discussion.

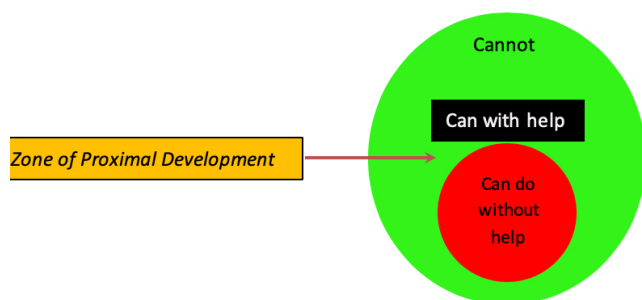


Figure 1

The characteristics of effective questioning

Research on questioning suggests that well-designed questions are vital in the processes of teaching and learning (Gall, 1970; Sanders, 1966; Wilen, 1991). By using appropriate, effective thought- provoking questions, students become full members of the learning process making use they high order thinking and developing reasoning skills. Effective questions are featured by the following characteristics:

- ✓ encourage curiosity and reflection;
- ✓ elicit deeper processing of information (Elder and Paul, 2002);
- ✓ clarify a concept;
- ✓ challenge existing thinking and encourage reflection;
- ✓ have a purpose;
- ✓ promote dialogue and interaction (Gibbons, 2002; Nystrand, 1997; Wells,1999);
- ✓ result in an answer that creates change.

Techniques for efficacious questioning

Well-designed questions trigger thinking, increase class participation, and benefit both teachers and students (Peterson & Taylor, 2012). For questions to be efficacious, teachers need to take into account certain guidelines prior to implementing them in class:

- **Phrasing:** Questions should be posed as full statements not as run-on, or with too much wording. Questions should be definite and unmistakable (Eble, 1988, p. 90, citing Fitch).
- **Adaptation:** Questions should be adapted to fit the students' level and meet the targeted concept.
- **Sequence:** Questions should be structured in a way that reveals the purpose of questioning and moving from less complicated ones to more complex ones.
- **Participation:** Teachers should ensure to involve a wide range of students by balancing between factual and thought-provoking questions.
- **Convergent and divergent questions:** Convergent questions require one correct or best answer. Divergent questions are open-ended and usually have many appropriate but different answers. Unlike convergent questions, divergent questions challenge students, and support learning.
- **Prompting questions:** Prompting questions provide hints/clues to help students answer the questions or to help them correct any initial response. A prompting question rephrases the original question.
- **Probing questions:** Probing questions are used when a student does not give a complete answer to a question. In this case, the teacher asks probing questions to seek clarification and/or guide the student to give a more complete answer. The following stems can be used:
 - ✓ What do you mean by...?
 - ✓ Could you explain that more fully...?
 - ✓ What are the reasons for...?
 - ✓ What would you have to change in order for/to ...?
 - ✓ What do you think would happen if...?
 - ✓ How was...different from...?
 - ✓ What is the link/relationship between...and...?
 - ✓ How do you know that...?
 - ✓ If you were in his/her position, how would you see this situation/react?
 - ✓ What did/do you hope/expect/wish when you saw/ read....?
- **Wait Time:** Wait time refers to the time a teacher waits, silently between asking a question and expecting an answer. According to Rowe (1974), the mean wait time for many teachers is less than one second which is not enough for students to think and formulate an answer. The research indicates that when teachers increase the wait time to five seconds, the students answer with greater confidence and diverse responses.

- **Questions- curriculum link:** It is of paramount importance to link questions to curriculum expectations.

Typology of strategies

The most widely used approach when asking questions lies in recalling information (Mehan, 1979). However, this approach, which consists of teachers asking a question and students answering, impede students' thinking and engagement. By planning and using thought- provoking questions, students explore new ideas, make predictions (Applebee, Langer, Nystrand, & Gamoran, 2003) and are led through the zone of proximal development. The following strategies are examples of questions that teachers can ask to encourage deeper students' thinking and foster their engagement.

Bloom's Taxonomy Bloom's taxonomy (1956) is a valuable system that scaffolds questions teachers can model to take students to a higher order of thinking. Bloom's Taxonomy has six levels of cognitive processing: knowledge, comprehension application,

analysis, synthesis, and evaluation (see figure 2). Levels move from the lowest-order processes to the highest. At the lower-order level questioning, students are required to recall previously acquired material. At the higher -order level questioning, students are required to use previously learned material to create/ support an answer with logical evidence. In 2001, Anderson and Krathwohl revised Bloom's taxonomy in terms of:

- **terminology:** knowledge is renamed as remembering;
- **structure:** "evaluation" is moved one level down and "creating" takes the highest level;
- **focus:** taxonomy is aligned with curriculum, instruction, and assessment (see figure 3).

Although Bloom's taxonomy has been revised since then, it remains up to the present a valuable tool de-emphasize the use of convergent questions (Cruickshank, 2009, p. 373) that impede students' ability to analyze, synthesize, and evaluate. (See Figures 2 and 3.)

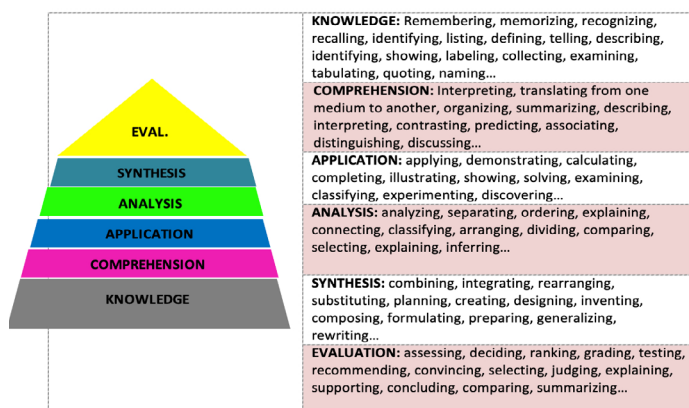


Figure 2. Bloom's Taxonomy of Objectives

The K-W-L Strategy The K-W-L strategy consists of a three-column chart. Columns are labeled: K, W, L. The teacher introduces the topic of an expository text and asks students to tell what they know about the topic of the text. Words, ideas, and phrases related to the topic are brainstormed and written down in column K. Then, the teacher asks students what they want to learn about the topic or what they think they will learn about the topic. Ideas are written in column W. Next, the students are asked to read the text and write down the new knowledge they acquired in column L. Once students are finished, students and teacher discuss the content of column L.

KWL Chart		
Topic: _____		
What I k now	What I w ant to know	What I L earned

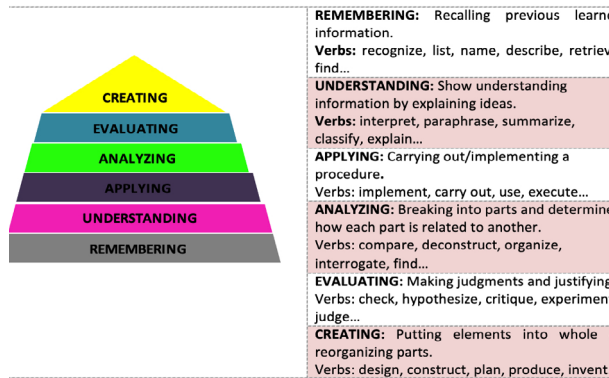


Figure 3. Bloom's Taxonomy Revised

Question the Author (QtA) is a comprehension strategy that engages students with the text by requiring them to ask questions while reading. The QtA aims at challenging students' understanding and strengthening their knowledge (Beck et al., 1997). Beck et al. (1997) identify specific steps teachers should follow when using QtA strategy:

- ✓ Select a passage that is interesting.
- ✓ Decide appropriate stopping points where students need to gain a greater understanding.
- ✓ Create questions that encourage critical thinking for each stopping point (what does the author mean?)

To introduce the QtA strategy, teacher displays a short passage to students along with one or two questions designed ahead of time. Students (individually or in groups) are invited to read and work through the questions

prepared for their readings. It should be borne in mind, at this level, that the role of the teacher is to facilitate the discussion, not lead it. When students ask questions that go unanswered, teacher restates them and encourages students to find the answer (s).

Guided Reciprocal Peer Questioning Guided Reciprocal Peer Questioning (GRPQ) is a strategy which encourages students to ask high order questions to each other about the content they are learning (King, 1990, 1991). The questions aim at promoting thinking and generating discussions. During the student-student interaction, ideas are elicited from peers and learning is shared. The GRPQ allows the teacher to circulate among groups, assesses both the students' questions and answers in order to identify areas of weaknesses and include remedial tasks in future instruction. The GRPQ is administered by:

- ✓ Forming groups of three to four students who take turns asking their questions and discussing their answers;
- ✓ Providing students with a sequence of lessons targeted through questions;
- ✓ Allowing a few minutes to students to formulate questions using a list of question stems as:
 - What causes ...?,
 - How do we know that ...?
 - Why does... happen when...?
 - What if...? What would happen if...?
 - What are the implications of ...?

Reciprocal Teaching Reciprocal teaching (Palincsar & Brown, 1984) is an interactive teaching strategy that supports students in improving reading comprehension. In reciprocal teaching, four comprehension strategies are modeled: predicting, clarifying, questioning, and summarizing) through guided group discussions. When implementing reciprocal teaching, the teacher uses four strategies to make students understand a text:

- ✓ **Predicting:** Predicting is the skill of making a guess. While reading, the students look for clues (title, bold print, tables, charts, diagrams, visuals...) to find out what will happen next in the text.
- ✓ **Clarifying:** Clarifying strategy involves using strategies to understand unfamiliar words. Since comprehension problems are due mainly to difficult words in the text, students should be taught skills like rereading, using the glossary/ dictionary, inferring meaning from context, using prefixes/ suffixes clues...
- ✓ **Questioning:** Questioning the text enables the students develop critical thinking skills.

By asking questions: how....? Why do you think...?..., students move to a higher level of thinking.

- ✓ **Summarizing:** Students pick the key points of a text and organize the information in a concise paragraph using their own words.
- ✓ **Pose, pause, bounce and pounce:** Pose, pause, bounce and pounce, is a no-hands up questioning strategy that promotes student engagement. It also improves questioning and the quality of responses. The 4Ps works as follows:
 - **Pose:** Teacher poses a question for students to think about.
 - **Pause:** Teacher allows enough time for students to think before answering.
 - **Pounce:** Teacher chooses one student at random to answer (no hands-up).
 - **Bounce:** When the student has given an answer, bounce the idea straight to another student to comment on or add to. The teacher can keep on bouncing the response around the class allowing more students to add their response.

Conclusion

By implementing questions that require high level thinking, teachers foster their students' engagement and promote critical thinking skills needed to address new situations. Unfortunately, although teachers are aware of the importance of articulating higher level questioning in their class, very few utilize them. In his study, Gall (1984) found that 80% of teachers' questions aimed at recalling, and only 20% made students to develop critical thinking. The result of the study was confirmed by Graesser & Person (1994) who found out that teachers asked 93 percent of all questions most of which are based on memorization. These results are revealing. They indicate that teachers ask questions that require memory recall of previously learnt information most of the time.

To maximize the potential of their students, teachers are invited to increase their use of higher order questions in order to challenge the thinking of their students and motivate them to become actively involved in lessons. Leading students towards high order thinking through effective questioning can result in the improvement of teaching quality and learning environment and students' self-reliance, thus benefiting both teachers and students (Peterson & Taylor, 2012).

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