

15 Questions and Questioning Technique

To question well is to teach well. In the skillful use of questions, more than anything else, lies the fine art of teaching.

Earnst Sachs

Good questioning is an excellent aid to teaching that is seldom utilized to the fullest extent. Most of us use questioning solely to assess students' knowledge and are less aware of its expanded value as an important teaching and learning tool. Good questioning is a major determinant of teaching and learning outcomes.

In this chapter, our tasks are to:

- Recognize the importance of good questioning
- Discuss various types of questions with examples
- Determine the necessity of wait-time during questioning

After completing the chapter, we should be able to diversify our questioning techniques and seize the many unexplored advantages of good questioning.

Teaching scenario: You are about to precept final-year medical students in a pediatric inpatient ward. You have chosen Anna for case-based discussion. Anna is a four-month old Down syndrome patient with presenting symptoms of respiratory distress. You have already decided the principal goal of the session: students should be able to generate the differential diagnosis of respiratory distress in a four-month old child and differentiate between these conditions.

A question refers to any sentence, regardless of grammatical form, intended to elicit an answer (Caesin, 1995). Consider these two examples: 'What is the commonest chromosomal abnormality in Down syndrome?' and 'List the common causes of respiratory distress in the newborn.' Regardless of the difference in grammatical construction both sentences share a common intention of generating a response from the students—i.e. an answer—and therefore qualify as questions. Thus, an answer is defined as any response that fulfills the expectation of the question (Caesin, 1995). Closed-ended questions require selection from a limited range of choices, whereas, open-ended questions allow students more latitude to choose answers.

The purpose of questioning in medical education is manifold. Good questions during teaching (a) help students to participate actively in lessons, (b) provide an opportunity to students to express their ideas and thoughts, and (c) allow students to hear divergent opinions from fellow students. They draw attention to and highlight important points in the teaching and develop confidence and feeling of success in the students leading them beyond the conventional patterns of thinking. Good questions also help teachers evaluate their students' learning and thus revise the lessons as necessary.

Despite the fact that good questioning effectively improves learning, studies show that proper questioning is seldom practiced

in teaching. Two main reasons for this lack are based on mistaken assumptions that questioning distracts the students from the lessons and creates undue anxiety for both students and teachers. On the contrary, proper questioning techniques help teachers to remain focused and create a conducive learning environment.

On the positive side, however, physicians are generally well-versed in questioning techniques. We use questioning every day with our patients that often starts with a few open-ended questions to elicit a range of responses. Questions like “How have you been in the last couple of months?” or “What can I do for you today?” are used to open the interview. Progressively, the questioning becomes more probing to seek clarification, broadening, or justification of prior issues and may involve selective use of close-ended questions. This pattern of progression and selection of different types of questions are analogous to many questioning techniques during teaching.

Types of Question

From educational viewpoint, several different types of questions are recognizable based on the intentions of the questions and nature of the anticipated answers.

1. Factual questions are used to get information from the students and often test rote memory.

Example: “What is the commonest chromosomal abnormality in Down syndrome?”

2. Clarification questions intend to provide clarity to both students and teachers. Such questions have important clueing effects and help students to revisit their earlier statements with alternative perspectives. We may use any of these as clarifying questions: “What do you mean by ..?” “Can you give me an example?” “Can you rephrase what you have just said?”

Example: “You mentioned possible thyroid problem contributing to Anna’s symptoms. What do you mean by ‘thyroid problem’? Can you give us an example?”

3. Broadening or extension questions enlarge the existing theme, explore implications of the response and can be useful in opening up further possibilities. Such questions can be used to assess additional knowledge of the students.

Example: "Do you know of any other chromosomal abnormality in Down syndrome?"

4. Justifying questions probe for assumptions and explore reasons for particular answers. These questions require significant comprehension and reasoning skills on the part of the students.

Example: "You mentioned respiratory tract infection as the most likely cause of Anna's breathing difficulty. What are your reasons for such a diagnosis?"

5. Hypothetical questions are used to explore students' understanding of complex situations beyond the scope of a particular encounter by creating hypothetical scenarios. Hypothetical questions often come in handy during the later part of teacher-student interactions when the basic facts and concepts are already established.

Example: "Suppose Anna has a ventricular septum defect and is taking diuretics to control her symptoms, how would you revise and rearrange the differential diagnosis of Anna's respiratory distress?"

6. Questions about questions probe for reasons for the question that students ask patients or teachers. This allows the students to verbalize their reasoning and understanding of the events leading to their own questions.

Example: "You asked Anna's mother whether Anna is taking any thyroid medications. Why did you ask that particular question? What are you thinking of?"

7. Redirected questions address the same question to several students and distribute responsibility. The benefits of such questions include generation of a wider variety of responses and allowing the students to evaluate each others' contributions. This technique shifts the focus from teacher-student interactions to *student-student interactions*.

Note that several of these question types, especially justifying questions, hypothetical questions, and questions about questions,

encourage the students to engage in critical thinking and utilize educational objectives with higher cognitive values.

As we recognize the various question types and reflect upon our own teaching we may be able to identify that many of our questions during teaching are in fact 'list questions' that require recall of previously memorized information. We seldom utilize the full range of question types. Unfortunately, list questions are relatively easy to formulate and curricula sadly over-emphasize factual information over critical thinking. Such low cognitive level questions limit students' learning by not helping them to acquire a deep, elaborate understanding of the subject matter. List questions often start with 'when', 'where', 'who' and similar words that generate a closed response. In contrast, higher order questions require synthesis of information, force the students to reflect critically on the topic, develop reasoning skills and thereby, instill much deeper understanding of the topic. One simple way of avoiding questions that will lead to mere repetition of facts is the careful selection of words and verbs including some selected verbs from Bloom's classifications (Table 1). Examples of such words include: why, how, justify (as in 'justify your statements'), describe, defend, elaborate etc. Let us compare and contrast these examples:

- "What is the commonest cardiac abnormality in Down syndrome?"
- "Suppose Anna has the cardiac problem that you just mentioned, can you discuss the anticipatory advice that you would provide Anna's mother?"

Both questions are important, but the second question requires students to think deeply beyond recall of simple facts and is pedagogically sounder.

Dealing with Students' Wrong Responses

It is to be expected that during question and answer sessions, students will answer incorrectly, make wrong assumptions, and may

Table 1. During questioning

Use less of	Use more of
What	Why
When	How
Where	Suppose
Who	Justify
Which	Defend
	Elaborate

not be able to answer the question at all. Frequently students fail to answer the question not because they do not know the answer but because the question itself may be unclear to them. In such cases, rephrasing and simplifying the question is all that is needed to elicit correct answer.

When students fail to answer any question, ask them the following:

- Is the question clear to you?
- Do you want me to rephrase the question?
- Which part of the question did you not understand?
- Is the question too difficult for you?

Teachers are responsible for correcting mistakes and guiding the students in the proper direction. These are delicate moments in teacher-student interactions and deserve to be dealt with carefully. The teacher's dilemmas in these situations vary from inclination to favor discovery learning in the form of continuing guided questioning to adopting a more humane stance by maintaining silence or responding in a neutral manner. With careful probing and guiding questions it may be possible to elicit the correct response, but there are risks of potential embarrassment and eventual damage to the teacher-student relationship. Adopting a more humane approach, although more compassionate and sympathetic, is unlikely

to correct the students' wrong responses and is pedagogically inadequate. Ende *et al* explored teachers' strategies of correcting wrong answers during clinical encounters and identified four possible strategies to deal with incorrect responses (Ende *et al*, 1995):

- Providing 'opportunity space' for revisions by not responding immediately and thus allowing the student time to come up with another answer
- Asking subsequent questions in a manner that contain clues to the first question leading the student to the correct answer
- Re-framing the questions so that the wrong answers become correct, and
- Treating the wrong answer as plausible but in need of further elaboration and consideration

These are useful approaches for the teachers to deal with situations when the students answer wrongly. Careful utilization of these approaches improves the chance of getting a correct answer from the students without jeopardizing the treasured harmony of teacher-student interactions.

Use of Silence

Some call it laziness. I call it deep thought.

Garfield[©]

Good questioning skills should also incorporate *proper use of silence*. As busy teachers we tend to interrupt the students right after a question is asked. The interruption may come in many forms: providing answers for the question, asking another question, providing own opinion, or even worse, outright criticism of the students' silence. It is rather illuminating to know that during typical teacher-student encounters, teachers rarely wait for more than 1.5 seconds after asking a question before interfering! (Tobin, 1987). As we promote and practice higher order cognitive questioning the use of silence becomes even more crucial. Unlike rote memory based ques-

tions, these higher order questions require significant mental processing by the students before any meaningful answer can be provided. So the period of apparent inactivity or 'wait time' is much needed.

Studies have documented that if the students are provided with even a modest increase of wait time, the length and correctness of their responses improve. They tend to be more forthcoming in providing answers, and the number of 'no answers' diminishes. Students are also more likely to produce high quality answers that commensurate with their higher cognitive abilities (Tobin, 1987).

Wait time benefits the teachers as well. With wait time, questioning strategies tend to be more varied and flexible and the number of questions decreases in quantity and increases in quality.

While we have discussed the benefits of wait time after the question is asked, a period of silence is also valuable after the students have *answered* the question. A brief period of silence at this point allows the students to reflect on what they have just said and permits us to consider their points thoroughly. It also conveys the important and much-needed message to the students about our attentiveness to their contributions.

The Benefits of Silence

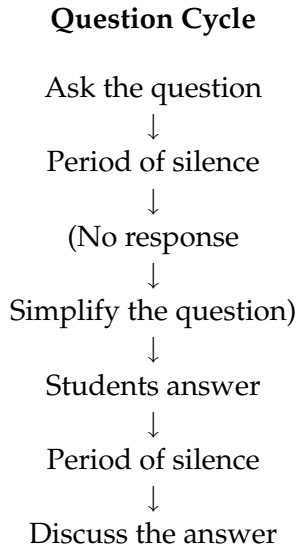
For the students

- More meaningful answers
- Improved accuracy
- Improved length
- Fewer 'no answers'

For the teachers

- Higher order questions
- Precise formulation of questions
- Varied and flexible questions
- Convey teachers' attentiveness

Conscious effort is needed on our part to make use of silence as a part of routine questioning strategies. Although there is no prescribed length for the wait time, depending upon the complexity of the question and the students' expected level of understanding, 10 to 15 seconds of silence seems to be adequate. This time corresponds roughly to three complete breaths or slowly counting from one to ten or fifteen.



Needless to say, bad questioning is detrimental to learning. The effectiveness of a question is determined by both the content and the way the question is asked. Thus, questions that commensurate with students' level of understanding, are high in clarity, and when accompanied by a period of silence, are likely to be successful. As we consciously practice these simple questioning techniques we will be able to create a learning environment where higher order thinking is expected and practiced.

In summary, we have learned that

- Good questioning is a major determinant of the success of teaching

- Justifying questions, clarification questions, hypothetical questions, and questions about the questions are better in promoting higher order thinking skill
- Failure of the student to respond to a particular question is often due to the lack of his understanding of the question
- A period of silence after a question is asked and after a response is given is essential

Tips on Effective Questioning During Teaching

- Phrase questions clearly and succinctly
- Ask questions with specific intention
- Allow ten to fifteen seconds of wait time after asking a question before requesting a student's response
- Encourage students to respond even if they are wrong
- Probe students' responses to help them clarify ideas, reasoning process, or expand on their thinking
- Do not make automatic assumption that failure to answer the question is due to ignorance
- Acknowledge correct responses from students
- Make conscious efforts to ask higher cognitive order questions

References and Further Readings

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