

What is a Good Question? Teaching Showcase 2017

Nick Long

Department of Mathematics and Statistics
Stephen F. Austin State University
longne@sfasu.edu

15 February 2017

We don't need no stinkin' questions!

After explaining to a student through various lessons and examples that:

$$\lim_{x \rightarrow 8} \frac{1}{x-8} = \infty$$

We don't need no stinkin' questions!

After explaining to a student through various lessons and examples that:

$$\lim_{x \rightarrow 8} \frac{1}{x-8} = \infty$$

I tried to check if she really understood that, so I gave her a different example. This was the result:

$$\lim_{x \rightarrow 5} \frac{1}{x-5} = \infty$$

Credit to Russell Franks.

The Necessity of Questions

- Questions are the most basic way to express the unknown.

The Necessity of Questions

- Questions are the most basic way to express the unknown.
- Learning is not the same as hearing. Response is necessary to assess understanding.

The Necessity of Questions

- Questions are the most basic way to express the unknown.
- Learning is not the same as hearing. Response is necessary to assess understanding.
- We have limited time with our students. Good questions matter.

The Necessity of Questions

- Questions are the most basic way to express the unknown.
- Learning is not the same as hearing. Response is necessary to assess understanding.
- We have limited time with our students. Good questions matter.
- Big push for sense-making, not answer getting.

Education is about questions

- Education is not simply a transfer of knowledge.

Education is about questions

- Education is not simply a transfer of knowledge.
- More than the Socratic Method

Education is about questions

- Education is not simply a transfer of knowledge.
- More than the Socratic Method
- Not a mind reader

Education is about questions

- Education is not simply a transfer of knowledge.
- More than the Socratic Method
- Not a mind reader (yet...)

Education is about questions

- Education is not simply a transfer of knowledge.
- More than the Socratic Method
- Not a mind reader (yet...)

A good question should solicit a response that involves the student's thinking.

Education is about questions

- Education is not simply a transfer of knowledge.
- More than the Socratic Method
- Not a mind reader (yet...)

A good question should solicit a response that involves the student's thinking.

We should not be looking for answers (those are in the back of the book!)

Education is about questions

- Education is not simply a transfer of knowledge.
- More than the Socratic Method
- Not a mind reader (yet...)

A good question should solicit a response that involves the student's thinking.

We should not be looking for answers (those are in the back of the book!)

We will be talking about the verbal questions you would use to interact with students, not the problems you would choose to have students work on.

I know a bad question when I see one...

- Does this make sense?

I know a bad question when I see one...

- Does this make sense?
- Are there any questions?

I know a bad question when I see one...

- Does this make sense?
- Are there any questions?
- What is the answer?

I know a bad question when I see one...

- Does this make sense?
- Are there any questions?
- What is the answer?
- Quick answers are not good answers.

So How Do I Ask Better Questions Smartypants?

Question (Big Ideas)

- *What do you want students to learn?*
- *What do you want students to do?*

These rarely amount to coming up with the answer but rather pertain to a process or way of thinking.

So How Do I Ask Better Questions Smartypants?

Question (Big Ideas)

- *What do you want students to learn?*
- *What do you want students to do?*

These rarely amount to coming up with the answer but rather pertain to a process or way of thinking.

Getting students to start talking is the hardest part

- Praise student work
- Use alternate representations
- Does this _____ always work?
- Why did you try _____?

When and How Should You Say Something?

Example

Happy Marriage

- Does it need to be said?

When and How Should You Say Something?

Example

Happy Marriage

- Does it need to be said?
- Does it need to be said by me?

When and How Should You Say Something?

Example

Happy Marriage

- Does it need to be said?
- Does it need to be said by me?
- Does it need to be said by me right now?

When and How Should You Say Something?

Example

Happy Marriage

- Does it need to be said?
 - Does it need to be said by me?
 - Does it need to be said by me right now?
-
- Patience is required. Awkward silence is a wonderful tool.

When and How Should You Say Something?

Example

Happy Marriage

- Does it need to be said?
 - Does it need to be said by me?
 - Does it need to be said by me right now?
-
- Patience is required. Awkward silence is a wonderful tool.
 - Never answer a question that a student can answer.

When and How Should You Say Something?

Example

Happy Marriage

- Does it need to be said?
 - Does it need to be said by me?
 - Does it need to be said by me right now?
-
- Patience is required. Awkward silence is a wonderful tool.
 - Never answer a question that a student can answer.
 - Sometimes individual discussion is needed.

When and How Should You Say Something?

Example

Happy Marriage

- Does it need to be said?
 - Does it need to be said by me?
 - Does it need to be said by me right now?
-
- Patience is required. Awkward silence is a wonderful tool.
 - Never answer a question that a student can answer.
 - Sometimes individual discussion is needed.

Observations

- Questions should not be asked only when a mistake has occurred. Mistakes are vital to the **process** of learning. Embrace productive struggle.

Observations

- Questions should not be asked only when a mistake has occurred. Mistakes are vital to the **process** of learning. Embrace productive struggle.
- You are not the holder of truth. If you're not convinced, there is problem something missing or wrong.

Observations

- Questions should not be asked only when a mistake has occurred. Mistakes are vital to the **process** of learning. Embrace productive struggle.
- You are not the holder of truth. If you're not convinced, there is problem something missing or wrong.
- You don't have to be at the front of the room to ask a question. Your questions are not just for the class as a whole but where one student is right now. This is the advantage we have over YouTube.

Observations

- Questions should not be asked only when a mistake has occurred. Mistakes are vital to the **process** of learning. Embrace productive struggle.
- You are not the holder of truth. If you're not convinced, there is problem something missing or wrong.
- You don't have to be at the front of the room to ask a question. Your questions are not just for the class as a whole but where one student is right now. This is the advantage we have over YouTube.

Question

What is Inquiry Based Learning?

Question

What is Inquiry Based Learning?

Inquiry-based learning (IBL) is a method of instruction that places the student, the subject, and their interaction at the center of the learning experience. At the same time, it transforms the role of the teacher from that of dispensing knowledge to one of facilitating learning. It repositions him or her, physically, from the front and center of the classroom to someplace in the middle or back of it, as it subtly yet significantly increases his or her involvement in the thought-processes of the students.

– E. Lee May, Salisbury State University