

Found ways to help students answer their own questions

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Why this Teaching Method Matters

Teachers who find ways to help students answer their own questions first help students to formulate good questions, and then guide students to answer these questions through inquiry and problem-solving. Active learning techniques can be employed in both forming and answering questions, thus fostering students' sense of curiosity and empowering them to engage in a process of discovery, rather than one of rote memorization or application of known formulas. Inquiry-based methods, such as the case-study approach, debates, role-playing activities, and simulations promote active learning (1). Through these types of activities, students begin to assume responsibility for their learning by identifying issues, asking questions, seeking information, and developing creative solutions. According to constructivist theories of learning, students who are actively engaged in the discovery process are building their own understanding of the world through experience and reflection upon that experience.

Another conceptual approach to helping students answer their own questions is to apply the lens of research, which involves asking questions, investigating them, and contributing to moving knowledge forward. In some disciplines, such as the sciences, the concept and practice of doing research fit more naturally into coursework with activities such as

labs and experiments. However, all disciplines employ techniques of investigation and interrogation, whether of a text, a cultural or historical period or event, or market fluctuations. Sharing your own research questions and investigative processes with students may excite and motivate them. Allowing students to see you struggle and work through the challenges of research may be uncomfortable for you at first, but it will provide them with a model of expert learning and knowledge-creation in your field.

Be aware that many students practice what Perry calls dualist thinking (2). These students expect any question to have a single correct answer, one known to the instructor. These students perceive their role in learning is to listen for correct answers shared by their instructor and then memorize those answers for later use on assessments. These students will be uneasy when asked to try to answer their own questions. Illustrating to these students that some questions have multiple defensible answers, some perhaps better than others, can help move them away from dualist thinking. Reminding students that when they leave school, they will need to be able to answer their own questions is another way to motivate them to take seriously the learning activities described here.

Applying this Teaching Method in the Classroom

As an expert in your discipline, you know how to formulate and refine questions to pursue the information you need, and you have multiple strategies for seeking out this information. Your role as teacher is to guide students to ask questions that are fruitful, relevant, and that lead them somewhere. This will involve helping students to recognize that there are different types of questions, and that question variants will lead down different paths of inquiry, and result in different "answers."

Bloom's Taxonomy (3, 4) of the cognitive domain, which provides a categorization of thought processes from least to most complex, can be used as a framework for posing questions at increasingly higher levels of understanding. Providing students with generic question stems based on Bloom's Taxonomy, such as those listed at Humboldt State University's Center for Excellence in Learning and Teaching (5), will help students to see how changing a question stem changes the nature of the

inquiry. These question stems leave behind the typical “what is...” questions in favor of prompting explanation (Explain why ____), hypothesis (What would happen if ____), application (What is a new example of ____), and analysis (What are the implications of ____). Showing students that questions can be structured around the types of information sought, and providing them with constructive feedback on their questions will improve their question construction technique.

One way to incorporate question-asking into what you are already doing would be to have students write down the questions they have prior to studying a new topic, performing a new task, or taking part in a new activity. If students submit their questions in advance, for instance on a discussion forum or course blog, you will have time to think about the questions and select one or two to address in class based on their relevance to the course goals. Seeing these questions in advance also makes it possible to better address areas of student concern and possible misconception. Students benefit from writing out the questions beforehand so that they spend some time thinking them through.

Next, use students’ own questions to guide their investigations, activities, or discussions. Some instructors even ask students to create quiz or test questions. Using student-generated questions, rather than ones you pose, will tend to engage students more in discovering the answers because they are invested in the process from start to finish, leading to increased satisfaction with their learning experience and a more positive attitude. By promoting an environment where it is safe to ask questions and to pursue different strategies for solutions, you will be encouraging openness and risk-taking. Ideally, the end result is that students will come to understand the cycle of question generation → problem solving → refinement or generation of new questions based on what was discovered (6).

Applying this Teaching Method Online

The online teaching and learning environment offers some unique opportunities for promoting question-generation and inquiry-based activities. For instance, blogs and other discussion boards can be structured around student investigations of readings through self-generated questions, which students then attempt to answer by pulling on additional resources, websites, etc. (7). Alternatively, a class wiki could be used to track student questions as well as to be a space where students would answer their own or other’s questions (8). Making ques-

tioning and thinking processes visible and public (within the class membership) on a blog or wiki allows students to both see new ways of thinking and to reflect upon their own investigative processes. Be sure to focus in these settings on questions that permit multiple points of view or can be argued in different ways. Questions with single correct answers will not generate the kind of peer-to-peer conversation needed to help students learn to answer their own questions.

The ability to reflect on one’s cognitive processes, or to be metacognitively aware, while reading, writing, or solving problems has important implications for students’ effectiveness as active, self-directed learners. Self-direction becomes increasingly important in online and hybrid learning environments where engagement with materials and with the instructor at a distance require more self-motivation and active involvement on the part of the student than many traditional classroom settings. If, as Marshall Brain claims (9), a student asking a question is at that moment an engaged, self-motivated learner, then the more opportunities for question-asking you can create, the more involved and engaged your students will be.

Another idea, which works in either an online or face-to-face environment, is to use technology to create backchannels of communication that are based on student questions (10). During lectures, for instance, Twitter or an online chat tool can be used as a way for students to ask questions that would normally be seen as interrupting the lecture. The professor, a TA or an assigned student can monitor the question feed in order to judge when it might be important to stop the lecture and address some fundamental misconceptions or confusion. And often students are able to answer their peers’ questions on the backchannel, giving students practice in answering questions that might occur to them as they learn. This method does have the downside of potentially distracting students from the matter at hand in order to write a question, and thus requires both careful planning and a willingness to get productively sidetracked.

Because directing their own learning through the discovery process will be new to most students, they will need encouragement as well as “scaffolding.” In the context of learning, scaffolding is a term adapted from architecture meaning to provide a temporary support which is later taken away when the student has acquired the skills and competence to complete the task or problem on his or her own. In the online environment, scaffolding can be built-in to guide a student through a learning task with links to webpages, tutorials, or group work involving peers who either hold different perspectives or are more advanced (11).

Assessing this Teaching Method

You can help students feel comfortable asking and answering their own questions if you create an environment in which inquiry is not only fostered but also rewarded. This may mean changing the way you give credit for assignments – from awarding all the credit for a correct answer to awarding partial or even total credit for a well-done exploration of a topic that arrived at the wrong answer. It may also mean establishing with your students that learning to ask and answer their own questions is an ongoing and formative process, whereby you expect to see effort and progress as the semester unfolds, and will grade based upon evidence of that progress, rather than on whether students reach certain benchmarks.

Because you are helping students become more meta-cognitive, it may be productive to have students engage in self-assessment and/or peer assessment. Self-assessment has the potential to teach self-judgment based

on criteria that have been either provided by the teacher, or have been generated through a collaborative process (12). Self-assessment can take the form of simple checklists or learning logs, where students routinely record short diary-like entries about their learning experience. In the online environment, feedback structured as a dialogue back and forth between peers has been shown to have a positive effect on student question-generation (13).

For maximum benefit, combine self- and peer-assessment with other assessments of students' learning to demonstrate the relationships of their questions to acquisition of new knowledge and skills. When students see that asking and answering their own questions is directly connected to more and better learning, their motivation and persistence will increase.

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