Tech Snacks: Curiosity in the Classroom

Curiosity is the desire for new knowledge, information, experiences, or stimulation to resolve gaps in our understanding or to experience the unknown.[1] When genuine curiosity is triggered in students, they're motivated to fill in their knowledge gap. So how do we generate curiosity in the classroom? What activities or prompts can get students excited about their knowledge gaps?

Question Formulation Technique

One popular framework for generating questions that create curiosity is the Question Formulation Technique.[2] QFT can be used as a brainstorming session before learning a new concept or beginning a new process.

> **Question Focus** — Present the class with a prompt or stimulus that starts the questioning process. A topic, image, story, situation, scenario, etc. serves as the focus for generating questions. An effective focus should be clear, should provoke and stimulate new lines of thinking and should not be a question.
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> **Produce Questions** — In small groups with a large sheet of paper, students write down as many questions as they can. Tell students to not stop to discuss, judge, or answer their own questions. Don't worry about the quality of questions, write everything down.
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> **Improve Questions** — Have the groups analyze and categorize their questions as "open," or "closed." Closed questions can be answered with a simple yes or no, or with one word. Open questions require longer explanation or context.
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> **Prioritize Questions** — Have each group select their three top-priority questions. Have them describe their rationale for prioritization, and note where they came in the process.
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> **Strategizing** — Have each group create an action plan or discuss next steps for finding answers to top-priority questions. Share group results with the class. Use the priority questions as a starting point to learn a new concept or procedure, trying to find answers to those questions along the way if possible.

Inquiry-Based Learning

Inquiry-based learning is an educational strategy where students follow scientific methods and practices in order to construct knowledge. Students formulate hypotheses and test them by conducting experiments or making observations.[3]

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[1] Eyler, J. (2018). *How Humans Learn, The Science and Stories Behind Effective College Teaching*. West Virginia University Press.

[2] Experiencing the Question Formulation Technique (2018). *The Right Question Institute*. Retrieved from http://www.ibmidatlantic.org/Experiencing-the-QFT.pdf

[3] Pedaste, Mäeots, Siiman, et al. (2015). Phases of Inquiry-Based Learning. *Educational Research Review*, 14, 47–61. Retrieved from https://doi.org/10.1016/j.edurev.2015.02.003

There are a number of different frameworks for inquiry-based learning, but most start with a questioning phase, where students are prompted to identify questions to be answered. This might take the form of a scenario or problem to be solved, or it could be a more open-ended environment where students choose a topic that they're curious about.

After asking questions, students must clarify their topic of inquiry. This can involve in-class discussion or independent research, and requires guidance and feedback from the instructor. At this stage students should resist forming opinions or looking for solutions. Instead they should make observations about their topic, form a hypothesis, and design an experiment to test their hypothesis.

As students design and conduct their experiments, they should share their process and results with the class. This can lead to conclusions and solutions, or can lead to further cycles of inquiry.

Essential Questions

One way to build opportunity for curiosity and questioning (aka "inquiry") into your teaching is to create "essential questions." What exactly is an "essential question" in this context?

Important, existential questions that recur throughout one's life (that fall within a particular field)

> "*Is war necessary?*"
> "*Why do people write fiction? Why do people read fiction?*"
> "*What would a world look like without diesel engines?*"

Key inquiries within a discipline

> "*Who writes a nation's history?*"
> "*Are engineers responsible when a project goes wrong?*"
> "*What makes a law just or unjust?*"

Questions that must be answered for the learning of core content (i.e., questions that help students make sense of important but complicated ideas, knowledge, and know-how)

> "*Was the Civil War inevitable?*"
> "*Why do we need hydraulics?*"

Essential questions can be posed at the start of a course or unit, as a discussion theme, or as a prompt for reflection papers or other assignments. The questions should not be easily answerable, but rather, open-ended with some room for discussion and interpretation. Course activities should prepare students to return to these questions with their own answers at the end of the unit or course.