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The Case for Curiosity

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Curiosity is essential to learning, but in scarce supply in most schools.

Einstein was wrong. I'm not referring to anything he said or wrote about physics but to his famous comment, "Curiosity is a delicate little plant which, aside from stimulation, stands mainly in need of freedom." Curiosity needs more than stimulation and freedom. For children to develop and satisfy their urge to know, they need role models, opportunities to practice, and guidance.

Walk up to almost any teacher in the United States, ask her whether it's good for children to be curious, and what do you think she'll say? If you think that teacher will say yes, you're right. When my student Hilary Hackmann and I asked teachers to circle on a list the qualities they thought were most important for students to acquire in school, many circled curiosity. When asked on the fly, adults in our society say they value curiosity. Intuitively, people feel it's essential to learning.

But what we admire and what we deliberately cultivate aren't the same. When researchers dig deeper, they find that many adults think of curiosity as a trait possessed by some but not others. Or they think that as long as the environment isn't too repressive, children's natural sense of inquiry will surface (Engel, 2011). In fact, when Hilary and I asked teachers to list which qualities were most important without giving them a list to choose from, almost none mentioned curiosity. Many teachers endorse curiosity when they're asked about it, but it isn't uppermost on their minds—or shaping their teaching plans.

Why is this disturbing? Because research shows unequivocally that when people are curious about something, they learn more, and better. Daniel Berlyne (1954) first demonstrated this in the 1950s. He read people lists of facts, including some that were surprising to them, and led them to ask questions. Later, when asked to recall those lists, subjects remembered the items that had piqued their curiosity better than the others.

It's not just adults who benefit from having their curiosity piqued. When children want to know something, they're more likely to learn it and remember it. Babies play longer with toys in which they've shown a prior interest and explore these toys more; their interest allows them to learn more than they otherwise would. When older students are intrigued by unexpected or mysterious descriptions in their reading, they're more likely to remember that content later, and to more deeply understand what they read (Garner, Brown, Sanders, & Menke, 1992).

Given that curiosity has such a positive impact on learning, you might assume that teachers are doing everything they can to encourage it. But that's not the case.

Where Have All the Questions Gone?

When my students and I observed suburban elementary classrooms in 2006, looking for signs of students' curiosity, we found a surprising absence of it. To gauge curiosity, we looked for

- The number and types of questions students asked (anything from "Where is the Sudan?" to "When is recess?").
- Stretches of time that students spent gazing at something (for instance, standing in front of an aquarium observing fish).
- Times when a student physically investigated something (such as opening up the back of a cassette machine).

For the most part, kindergartners asked very few questions and spent little time investigating the environment. In any given two-hour stretch, we'd see anywhere from two to five questions or explorations. What students were doing instead was often engaging to them, or educationally productive—learning about the sounds of letters, discussing the day's weather, detecting visual patterns on worksheets, and the like. But students weren't coming up with questions about what they wanted to know, spending time learning how to answer those questions, or exploring the physical world.

In the liveliest classrooms, kids did lots of hands-on activities—acting out scenarios, building with blocks, following instructions to do an experiment, and so on. But in virtually all these activities, students followed adult instructions, and, in most of the more experiential activities, the teacher had a very clear idea of what students should get out of the activity.

When our transcripts noted questions, they were most often asked by the teacher: "What do you think this is?" or "What makes bears different from birds?" In some cases, when a student piped up with a question that might lead the discussion in another direction, the teacher kindly but firmly put that question aside to get back to the lesson's focus.

In 5th grade classrooms, the situation was even more striking. A typical two-hour stretch of time often didn't yield even one student question. That means 11-year-olds often go for hours at a time in school without indicating anything they want to know about.

The irony is that children are born with an overpowering need to know. They want to know what every object feels and looks like and what will happen when they attempt to do different things with that object. They want to know why people behave the way they do. This voracious appetite for knowledge defines us as a species. And it doesn't evaporate when babies become toddlers. Every preschool teacher knows that children between the ages of 18 months and 5 years are insatiable for information. Their curiosity drives much of their learning—through asking questions, watching what others do, listening to what adults say, and tinkering with the world around them. But somehow the incessant curiosity that leads to so much knowledge during the first five years of life dwindles as children go to school.

Encouragement: A Key Ingredient

What might explain the gap between the intense curiosity of young children and the apparent lack of curiosity among older children? I think many adults implicitly believe that children naturally get less curious over time. This belief isn't totally unreasonable. Data do suggest that curiosity becomes less robust over time (Coie, 1974). And if curiosity is, as psychologists say, the urge to explain the unexpected, then as more of everyday life becomes familiar, a child might encounter fewer unexpected objects and events. Perhaps the reduced curiosity of the 7-year-old is simply a by-product of that child's increased knowledge.

However, adult influence may also be a factor. When researchers invite children into a room containing a novel object, they find that children are very attuned to the feedback of adults. When the experimenter makes encouraging faces or comments, children are more likely to explore the interesting object. Experiments I've done show that children show much more interest in materials when an adult visibly shows how curious *he or she* is about the materials. In other words, children's curiosity can be fostered or squelched by the people they spend time with.

Although it's hard to discourage the investigations of a 2-year-old, it's all too easy to discourage those of 7-, 11-, or 15-year-olds. In one classroom I observed, a 9th grader raised her hand to ask if there were any places in the world where no one made art. The teacher stopped her midsentence with, "Zoe, no questions now, please; it's time for learning."

Often the ways in which teachers unwittingly discourage curiosity are much subtler. By the same token, teachers can also encourage curiosity in subtle ways. One teacher I've observed often begins sentences to her students with the phrase, "Let's see what happens." She's showing them the value of finding things out.

What Can Educators Do?

If you consider both the idea that curiosity is a powerful elixir for learning and the idea that as children age their curiosity requires more nurturing, it's clear teachers should pay serious attention to helping students acquire or retain a thirst to find out about the world.

Easy to say; harder to do. Teachers are faced with umpteen goals and many obstacles that get in the way of meeting them. We want students to read, learn algebra, master scientific concepts, understand fundamentals of their nation's history, work things out with peers, become motivated to do well on unappealing tasks, and much more. Society expects teachers to do all that with students who have widely varying levels of skill and motivation. It's

understandable that taking time to foster something as amorphous as students' eagerness to explore the unexpected would fall off the to-do list.

Further, teachers are less likely to encourage questions, tinkering, or deviations from the script when they feel pressure to accomplish goals that might not leave time for questions, tinkering, or deviations from the script. In my lab, I found that when teachers were subtly instructed to help children learn about science, they were more likely to encourage children's questions and unexpected manipulations of materials. When teachers were instead subtly encouraged to help students finish a worksheet, they were more likely to discourage children's investigations.

Given curiosity's central role, it's essential to figure out what educators can do to help students become more—rather than less—curious over time. An equally important question is, How can we help children gain expertise in satisfying their curiosity? Here are four suggestions.

1. Hire Curious Teachers

Schools should hire teachers who've demonstrated that they're curious. It is hard to fan the flames of a drive you yourself rarely experience. Many principals hire teachers who seem smart, who like children, and who have the kind of drive that supports academic achievement. They know that teachers who possess these qualities will foster the same in their students. But why not put curiosity at the top of the list of criteria for good teachers?

How do we judge whether someone is truly curious? A teacher's thirst for finding out should be evident in what he or she has done or in how he or she behaves. Sometimes a teacher with plenty of curiosity has done scientific research or spent years studying some topic of personal interest (such as butterflies or architecture). Sometimes their curiosity is expressed as an urge to know more about their students. Often teachers of young children excel because of their unending interest in early development. Either way, the teacher who knows what the itch to find out feels like is in a better position to foster that itch in students.

2. Count Classroom Questions

Teachers should record lessons or conversations in their classrooms and then count and categorize the questions their students ask. In his groundbreaking book *Better*, physician Atul Gawande (2007) encourages people in the medical profession to "count something." He means that causal intuitions about what's happening in one's workplace can be misleading. Even the most thoughtful reflection at the end of the day does not provide the same information as actual recordings.

This observation is as true of schools as it is of hospitals. Few teachers readily see that they're discouraging students' questions, just as few parents readily see that they're short-tempered with their children. Precise and methodical data collection enables us to learn things that are counterintuitive. Teachers who watch video recordings of themselves and count the number of questions students ask will see how much inquiry is being expressed in their classroom—and they'll learn how they respond to students' inquiries.

Moreover, simply by counting questions, teachers will begin to be more aware of them, which will thereby encourage more questioning. Other riches lie in store for them. Teachers can also discover what kinds of things individual students are curious about, who asks lots of questions, and who never asks one. By attending to the quality of their students' questions, they can get ideas about how to help their students develop better questions. What better cues are there for thinking up new activities or topics to discuss?

3. Make Questioning a Goal

Think of question asking as the goal of an educational activity, rather than a happy by-product. Develop activities that invite or require students to figure out what they want to know and then seek answers.

One easy starting place is urging students to use the Internet to ask any question that occurs to them—or arises in class discussion or work. Google can be a curious person's best friend. For instance, today I used Google to answer the following unexpected questions: Which of Henry VIII's wives came after Anne Boleyn, what kind of milk is

Mozzarella made of, and what does the city Hyderabad look like? The ease with which we can look things up online is exhilarating—and it makes the urge to know feel good more often.

Of course, a class that invited students to ask questions without helping them seek accurate answers or acquire a robust body of knowledge would leave the educational task half done. The child who's genuinely curious doesn't rest until he or she has satisfied the urge to know. So to cultivate students' curiosity, we must give them both time to seek answers and guidance about various routes to getting answers, such as looking things up in reliable sources or testing hypotheses.

Teachers should encourage students to think about whether their original question has been answered to their satisfaction. These techniques are the bread and butter of the autodidact. Students who learn to teach themselves something new are better prepared for lifelong learning than those who simply learn well from others.

4. Measure Curiosity

It doesn't mean much to value a quality like curiosity in children if you never assess whether it's present. What we measure is what we'll teach. In classrooms where teachers are deliberately cultivating curiosity, they should see more of it in May than in September—and they should see their own responses becoming more encouraging.

Video recording is a great tool for this work. Teachers should regularly videotape activities in their classrooms and score one another's students (to increase objectivity and accuracy) on things like individual students' level of interest, the number of exploratory gestures students use when encountering materials or objects, and the duration of each student's engagement with one activity.

Teachers who keep journals of their daily work with students might go through them at the end of the year to see how many occasions they created for students to figure out what they wanted to know—and pursue answers.

Actually, Einstein was partly right. Curiosity is delicate, and it does need freedom and stimulation. But that's not enough. It needs to be fostered and guided by teachers who feel curious themselves, and who value curiosity. Curiosity isn't the icing on the cake; it's the cake itself.

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