Wonder - Chapter 7 of "Faithful Teaching: Values and Themes for Teaching, Learning, and Leading Purposeful and Principled Education"

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FOR DECADES, I HAVE hiked in the Rocky Mountains of western Canada. On one such hike, the three men with me and I froze in our tracks, single file, when we surprised a ptarmigan next to our trail. This member of the grouse family, who enjoys good camouflage, never flinched while the four of us kept our gaze from a few meters away. We—that is both parties—held our positions for about two minutes, the hikers in a state of wonder, and the bird ... I cannot guess. By wonder, I mean that we were silent, amazed, and in awe. We were attending fully to the bird and were quite unaware of the passage of time, the weight of our packs, our shortage of breath, or the burning sensation in our legs. Some would say we were childlike.

As it happens, the ptarmigan needs good camouflage because of a widely reputed shortage of intelligence; he is no crow when it comes to cognition. On that occasion, I had the last position in our group and therefore had in my field of vision not just the bird but also my three companions. I would love to claim that we stood enraptured by this bird for the rest of the afternoon. I do not recall who spoke first or if anyone spoke at all. But my own humbling epiphany came when I realized that a bird—that there is no more appropriate adjective than a stupid bird—had the power to stop in our tracks four adults, all of us called “doctor” at our respective medical and
academic workplaces. Our collective IQ was well beyond that of the bird in front of us. This dramatic contrast of intelligence levels produced my epiphany and the humility that followed.

In narrating my friends' and my encounter with the ptarmigan, I am trying to persuade you and perhaps myself of what artists and poets have called and invited us to do for generations: to live in wonder. As busy educators, we can easily get mired down in the details of curriculum, planning, assessment, and the myriad other administrative details of our work. But I want to invite us in this chapter to (re)discover the artists' and poets' invitation to live in wonder. And I want to invite us to think about our curriculum, planning, and instruction in ways that invite our students to do the same.

We have all had similar experiences in nature to the one I described above. Some of us have seen the Milky Way, perhaps on a thousand different pitch-black nights. Some have seen the aurora borealis or northern lights. Some have hiked, peddled, climbed, and paddled to natural places that took our breath away, usually in wonder but probably sometimes in fear. Extremes of weather and the power of that weather can reduce us to wonder. As some poets have told us, the world is alive with God's splendor. And for many of us that splendor produces wonder.

But there are other sources of wonder. Human actions and products also may cause us to wonder. In galleries, I have stood in awe of the abilities of artists and the gifts of beauty they have given us all. As have you, I have heard great music, not only from Bach and Rodriguez but from Diana Krall and Eric Clapton. Great buildings have elevated my eyes and thoughts, while increasing my admiration for those who designed and built them. Fyodor Dostoevsky and Flannery O'Connor have troubled me with their words. Dorothy Sayers and Woody Allen have used theirs to make me cry and laugh and wonder. I stand in awe of and in debt to these and many other writers. How can one not wonder—and I do not mean about plagiarism—when a student writes an outstanding paper or even a great sentence? And how can one not wonder when someone sends a card at just the right time, or when one sees, as I have seen, a Volkswagon Golf stop instantly on the wet granite cobblestones of Prague...as if the mighty hand of an angel had held the car back to prevent injury to the impetuous boy of four who had just jumped in front of it from the curb?

Like you perhaps, I have also wondered at other human capacities, or the lack thereof. A lawyer friend tells me about defending a young man
caught trying to steal a car from inside a locked police compound and then, on the phone, saying to my friend, “How do you think we should plea?” Another lawyer friend tells me of three people who loaded a stolen car with stolen fur coats as a security guard across the street described the unfolding scene to the police over the telephone. “How can someone be that stupid,” I wonder, I couldn’t write something that funny! On the other hand, I can read in the newspaper at any time about the unspeakable evil that people do to other people day after day, in crystal meth labs, in government chambers, in back alleys, and in high-rise office towers. These human capacities—for evil and stupidity—lead one to wonder as well (although some might prefer the word dumbfounded for our responses to such behaviors as these, wanting to preserve wonder for natural or at least positive phenomena).

Give thanks that we hear about the human capacity for courage and kindness as well. Stories of personal sacrifices, courageous rescues, great gifts . . . these lift our spirits. Mother Teresa’s story may have become a kind of cultural cliché, but for good reason: the world was forced to wonder at her vision for the poor. Mother Teresa serves as a public paradigm, but we all have cause to wonder at similar stories closer to home, perhaps ones in which we function as characters and not just narrators. I keep a simple, framed magazine photo of her face on my office wall to remind me daily of how she responded to her vocation. Her photo prompts me to ask, “How did she do it?” and “Why did she do it?” In a sense, that photo keeps me wondering.

In short we may wonder at lots of things. I hope we do. But I fear that our society has lost much of its capacity to wonder. I want to know where it went. And why?

NO WONDER

In part, wonder went away because of our scientific advances and our expanded understanding of how the world works. Picture this scene if you will. On a Saturday morning visit to the natural history museum, my two daughters and I stand before an animated, half-size T-Rex, waiting for its computer-generated roar and movement to begin. No other museum guests happen to be present at the moment that Megamunch (as he was known) begins to move his head, open his jaws, and fill that part of the museum with his roar. My younger daughter, four years old and terrified, instinctively seeks the assurance of my hand and the security of my leg.
Seeing her fear, her seven-year-old sister hugs her with one arm, and reassures her with these words, "Don’t worry, Kristen, it’s just a cassette." The cassette may date the story but the story's point is timeless. By age seven, what should have been a natural fear in my older daughter had disappeared because she understood how T-Rex worked. To be fair, she had witnessed his roar on previous museum visits, but even with that information in hand, her technological savvy—her knowledge of what was behind it, so to speak—reduced her awe, her capacity to wonder at T-Rex.

To understand where wonder went, we need to back up a few centuries from that 1990 Saturday morning in Regina, Saskatchewan, to the early 1600s, a time that many historians name as the birth of the modern period. Recall that, for Europeans at least, the Medieval worldview which had remained in place for several centuries had been broken by the dramatic expansion in knowledge associated with the Renaissance and the age of exploration, and by a similarly dramatic reduction in how ordinary people understand authority after the Protestant Reformation. A new world and a new worldview had opened. Scientists such as Francis Bacon, who published *Novum Organum* in 1610, and philosophers such as René Descartes, who published *Meditations on First Philosophy* in 1623, wrote about knowing and certainty so persuasively that people of all social classes began to see the world in literally a new way. Explanations of reality that had sufficed nicely for centuries proved unsatisfactory. We all recognize the gains humans have made by understanding that scientific observation (following Bacon) and rational deduction (following Descartes) are legitimate ways of gaining knowledge.

However, left to their own devices, science and rationality may become scientism and rationalism. Either way, the certain knowledge they offer has the power to disenchant—to take the enchantment or wonder out of—the world, a subject explored articulately by many others (for example, Bais, 2010; Taylor, 2011). As I write, in 2012, we have a reduced capacity for wonder, although we have not lost it completely. Still, at this point in our history, we may be more inclined to be wonder-struck by a laser show than by lightning or by the advertised capacities of the latest phone than by the intimacy of face-to-face conversation.

Science, with help from its child, technology, reduces our capacity to wonder in another way: by providing us so many ways to mediate the world we live in and thereby deny ourselves direct experience of that world. To illustrate, our forebears had a much more direct experience of home
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heating than we do. They chopped or bought firewood, hauled it to the woodpile and then to the fireplace or stove, and several times per day took steps to keep a fire going... all to avoid a more direct experience of winter. Our own experience is highly mediated: most of us pay a utility to supply us with electricity, gas or oil. We set a thermostat, perhaps with twenty-eight different programmable cycles so our house stays warm on the days when we are home and cooler when we are not home or at night. For the most part—if the thermostat is working correctly—we rarely have to think about temperature. Thanks to the furnace and thermostat, we mediate our experience of winter much more easily than our forebears did with wood heat. Thanks to the digital thermostat with multiple settings, we can even mediate the work required to run the thermostat.

Dozens of similar examples come to mind. Our shelters themselves are meant to mediate the seasons and the day's weather. We use elevators and escalators to avoid experiencing the actual height of our buildings. We use an array of electronic devices to mediate the distances over which we want to communicate. We substitute texting for face-to-face communication (or “FTF,” as we now abbreviate it to mediate the time and key-stroke demands placed on us by full words). We substitute online games for face-to-face games. We substitute recorded music for music we might make ourselves. We substitute shopping for building, crafting, sewing or growing what we need. We use automobiles to mediate the time and distance involved in travel by foot. Lest we get bored during the already abbreviated time required in transport, we entertain ourselves with music. Those whose music comes from a car radio may mediate the spaces between songs by changing channels to avoid the annoyance of hearing from the advertisers who pay for the songs. We mediate our sickness with medicine and all manner of work with machines. A Luddite would love this lament so far, so let me make clear that I happily take advantage of many of these forms of mediation. My concern is that we allow too much of our lives to become mediated, even in those areas where mediating our experience offers little apparent return. And in living lives mediated to such degree, we perhaps deny ourselves many occasions to wonder.

Does all this mediation really stifle wonder? Not necessarily, but typically. I enjoy the spectacular, whether that spectacle involves the roar of race cars, a laser show or the latest computer advance. I might even admit the word wonderstruck into my response to the spectacular. And I confess to surviving only five minutes when I set out to finish my current basement
using only a hand-saw (in an ill-conceived plan to understand better my long-dead grandfather who worked as a carpenter). But what if our culture is all allegro and no adagio? Will we lose our capacity to experience wonder in the face of silence? Given the cultural shift toward more and more mediation, entertainment and technique, if we want to recover wonder we will need to be deliberate about engaging in direct experience. Whatever aspect of daily life we think about—work, transport, food, music, and conversation—mediations offer themselves to us. If we want to recover wonder and our collective capacity to wonder, we will necessarily have to seek unmediated experiences in our own lives and in our classrooms.

Discussion Questions

Recollect a scene or vignette from your own life where you were struck with wonder. What were some of the features or qualities of this scene.

Recollect a scene where you realized that you no longer responded in wonder to a phenomenon that would have caused you to wonder at an earlier time in your life. What are some of the factors that you think led to the diminishment of wonder over the intervening years.

List some ways that you mediate your life that you could experience directly, at least on a trial basis, without too much difficulty.

Our personalities are all different. Some of us respond more easily to natural sources of wonder while others of us respond to the latest technologies. Still others become wonderstruck by conversation, music or art. In your case, what sources of wonder work most powerfully. What might we learn about God or ourselves from our individual differences in this dimension?

THE WONDER CONVERSATION

Literally hundreds of writers have addressed wonder. Indeed, the line of artists, writers, theologians, psychologists, and philosophers stretches back as far as classical Rome and Greece. Wisdom calls for noting just a few voices here. Sam Keen invited me into this conversation decades ago with
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his Apology for Wonder (Keen, 1969). In my later section on wonder in our classrooms, I will recommend this title for anyone wanting a compelling invitation to live in wonder. Paul Griffiths offers some surprising insights on curiosity and a wonderful chapter on wonder in Intellectual Curiosity: A Theological Grammar (2009). He sees curiosity as a needed value or disposition for doing science but distinguishes it from wonder, which he understands to be a form of awe in the face of God’s creation (on the links between curiosity and wonder, see Dewey, 1935; Opdal, 2001). I think any Christian would benefit from reading Griffiths, certainly any Christian whose vocation is teaching. Although Barbara Fiand tills some of the same ground as Griffiths in her Awe-Filled Wonder: The Interface of Science and Spirituality (2008), she makes links to mystical experience and, as she understands it, the false tension between science and faith. For readers wanting to explore this dimension further, I also recommend Deane-Drummond (2006) and Cooling (2006).

Robert Fuller has written Wonder: From Emotion to Spirituality (2006), an accurately-titled and quite readable exploration of some connections between wonder and spirituality. Fuller argues that wonder actually increases human sensitivity to the spiritual dimension; that is, people who wonder are more likely to embrace religious faith, an argument that should not surprise readers of this current volume. More recently than Fuller, William Brown has written The Seven Pillars of Creation: The Bible, Science and the Ecology of Wonder (2010). Brown examines seven different scripture passages related to the physical world and God’s view of it. Anyone who resonates with Griffiths’ or Fiand’s work on wonder will likely enjoy Brown, as will those who love Scripture but who weary of controversies about creation and evolution.

Finally, I recommend Matthew Crawford’s Shop Class as Soulcraft, (2009), published in Europe with the intriguing title: The Case for Working with Your Hands, or Why Office Work is Bad for us and Fixing Things Feels Good. Crawford gives a good deal of his effort to reminding all of us, but especially educators, that unmediated experience yields benefits to the learner. Although each day we seem to increase the degree to which we mediate our own and our students’ experience with more technology, we still live in a material world and contact with that material can generate wonder. When Madonna claimed some decades ago that we live in a material world, she offended many Christians, including me, because I want to argue that our world is also spiritual, alive everywhere with the pulse of God. But
Madonna was partly right. We deal with material things all day long and we are made of material. Even our language, by connecting the words *human* and *humus*, reflects the connection the Genesis creation account makes between soil/clay (Hebrew *adamah*) and human (*adam*). I doubt very much that Crawford’s book grew out of Madonna’s philosophy-put-to-music, but we need to take our materiality seriously, and a great place to start doing so is between the covers of Crawford’s book. To help yourself grasp his point, I recommend you get a paper edition, not an ebook.

A THEOLOGY OF WONDER

In response to my comment that I was trying to understand and write about wonder, someone suggested to me that wonder was a *creaturely response to God’s created order*. I think this phrase catches the conception of wonder Griffiths builds in *Intellectual Curiosity*, which I mentioned. It also catches much of what I would say if I were to write an extended theology of wonder. Thankfully, as I noted in the previous section, several writers have capably approached that task already (as have McGrath, 2002; Sigrist, 1999).

What might a theology of wonder look like? Consider these passages from Scripture for a sampling of what its tone might be. The Genesis accounts of creation have God thinking the creation very good once it was complete (Genesis 1:31). In the story of Job, God’s creative wonders actually constitute a theme, with animals, birds, plants, fish, stars, and seas all apparently pointing to God’s power and, in some cases, even aware that God does marvelous things beyond human understanding (Job 9:10). In Psalm 139, we discover a Psalmist in awe of God’s work. On this account, God knows the details of our lives before conception; we are fearfully and wonderfully made (Psalm 139:14). Neither do the New Testament writers shy away from such themes. At least one author finds wonder as a motif in the Gospel of Mark (Dwyer, 1995), and the Apostle Paul stands in awe of Christ, in whom and for whom the whole created order exists, and through whom it holds together (Colossians 1:15–17). In fact, on at least one account, wonder runs right through Paul’s theology (Davis, 2006).

Without overwhelming my readers with more references, let me suggest that the biblical writers cited here invite us to make an appropriate creaturely response to God’s power and the Divinely created order. Indeed, I want to live my own life as just such a creaturely response. And I certainly
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want my classroom—whether in a public or a faith-based setting—to be a place of invitation for others to make the same response.

CREATING SPACE FOR WONDER IN OUR CLASSROOMS

In this section, I want to suggest several conditions that we will likely need to meet if we want to create a learning/teaching space where students are invited to wonder. Mixed with these conditions, I want to suggest strategies that teachers might use to make the invitation to wonder more clear to their students.

Passion, and Living in Wonder Ourselves

Teacher passion is an obvious precondition for students to hear an invitation to wonder. At some time, we have all used the word *passion* to describe a teacher’s enthusiasm for her subject. And we often describe such passion as *infectious*, knowing that students take their cues from their teachers. A resigned or bored teacher produces bored and resigned students. An enthusiastic or passionate teacher leaves a few students scratching their heads but inspires most students. Think of how many adults attribute their first stirrings to become a chemist, writer, lawyer, teacher, botanist, or doctor because of a passionate teacher. Some educators have tried less effective ways to inspire students. Yelling about the importance of a subject, for example, or developing an intimidating course syllabus both have the opposite affect on enthusiasm from that intended by the teacher.

If we want to teach in classrooms characterized by wonder, we will need to live in wonder ourselves. I recognize that doing so is hardly a checklist item like renewing a car registration. But we can take steps. For starters, I think reading Sam Keen's *Apology for Wonder* would help people recover their capacity for wonder. I recommend it without reservation to any educator at any level. Second, we may have to discipline ourselves to take some time every day simply to be quiet. The little research on wonder we have seems to show that people are not usually wonderstruck unless they have predisposed themselves by cultivating habits of stopping, seeing, and hearing. I would not dare suggest that we all stop in the same way; out of necessity we will find different forms. While the forms may differ, the necessity remains common for all of us.
If we are to create a space in which our students know that they can be wonderstruck and if we have found ways to open ourselves to wonder, then we will need to let our students know about the things that lead us to wonder. We will need to show and tell. I think of an English teacher who told of her own excitement and ongoing education by asking her students this rhetorical question every day, “Do you know what I learned on the Internet last night?” She would then proceed to tell them. This same teacher created such excitement about Jane Austen's *Pride and Prejudice* that a class of high school seniors memorized one of the dances from the Netherfield Ball, as portrayed in the six-part BBC production with Colin Firth. As a surprise gift, they danced it for her at their own graduation. What teacher receives a gift like that from students? In this case, one whose own constant wonderment at Jane Austen rubs off on all around her. For that matter, what kind of students get swept away by Austen to that degree? In this case, the students whose teacher allows her own capacity to wonder to show.

Obviously, we don't all care for Austen to the degree that my friend cares for Austen. But the point of my story applies: we will need to incorporate occasions for and invitations to wonder into our curriculum, instruction, and, yes, even assessment. Some may respond to my assertion that such incorporation might be easy in a subject such as science where resources are available with titles such as *A Head Start on Science: Encouraging a Sense of Wonder* (Ritz, 2007; Van Noy, 2008; Vygotsky, 1978) and where the subject matter is inherently amazing . . . think the endocrine system or galaxies. Actually, subject matter is a diversion here. The key is in how we set or frame the subject matter. There are teachers who could make the endocrine system or galaxies boring and there are teachers who can make prepositional phrases interesting. My point is that we can invite our students to wonder in every subject area, not just the first one any one of us thinks of as more inherently capable than another of inducing or inviting wonder. And I believe that teachers who express passion about the curriculum contents and who live in wonder themselves sweep the students along with them.

Questions and Inquiry

Teacher passion and wonder alone will not generate wonder. Great instruction requires great questions, whether in a textbook, on a website or hand-out, or in class or small-group discussion. The great question must meet
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several criteria. To generate critical thought, the question must require students to draw on an array of knowledge. Note the difference between (a) "What year did the Berlin Wall come down?" and (b) "How do you think secondary students on both sides of the wall would have responded to changes in their society that resulted from the collapse of the wall and what it symbolized for the formerly divided city and country?" While I hesitate to offend my readers by calling your attention to the obvious difference between the two kinds of questions, I must point to two facts. First, the culture of assessment within which most teachers now do their work rests on a layer of assumptions, including the assumption that worthwhile learning must be measurable. A computer can grade 20,000 students' answers to question "a" above faster than teachers can grade 20,000 students' answers to question "b." In short, we educate in a culture of assessment. But second, as educators in a culture of assessment, we often cave too quickly; we blame the policy-makers (perhaps rightly) but we stop looking for ways to ask question "b." I believe that students can learn the answer to question "a" and still engage critically with deeper questions.

I hesitate to point to the obvious difference between the two questions for a second reason, one that should sober us all. Many teachers do not themselves aim to—or perhaps possess the skills to—create questions like question "b" above, questions that require critical engagement. As a result of these two realities (and likely others), classrooms and students want for wonder. And they will continue to want for wonder as long as policy makers continue with politically-popular understandings of assessment and teachers lack the skills and dispositions to move students into modes of critical engagement, what Vygotsky (1978) called the zone of proximal development.

Great questions must meet a second criterion: the teacher cannot always know the answer. Some readers will disagree with me immediately, but please let me nuance my claim. A teacher will obviously know what year the Berlin Wall fell, what letter comes next in a Kindergarten student's surname, and a thousand other facts. But even on "what letter comes next?" (where the teacher knows the answer) the good teacher will proceed with the student—will construct a learning situation—where the student has to think. For example, the teacher might say, "You suggested that the letter 'p' comes next in your name. Let's sound it out with a 'p' to discover if that's right."
The social studies teacher in my scenario likely has some pretty good ideas about why the Berlin wall came down and maybe about some of the ways that adolescents responded to changes in post-unification Germany. But she still plans her instruction so that students need to think deeply to answer her questions. We know that some teachers, faced with the question of adolescents' responses to the fall of the Berlin Wall, would provide a bulleted list to their students rather than ask their students to work out those answers through research, imagination, writing, and discussion. We can all live in hope that all teachers would become creatures of pedagogical imagination. We can even hope that many teachers would develop the courage and skills to ask the students themselves to identify what questions the collapse of the wall must have raised for Germany, that is, to lead their students into enquiry learning. Such teachers will find both encouragement and help in the writings of several who have addressed the connections between enquiry learning and wonder (Ciardiello, 2003; MacKenzie, 2001; Siejk, 1995; Stark, 2005).

Direct Experience

I begin dealing with the matter of mediated and direct experience by briefly mentioning two educators who have written before me about the importance of direct experience and materiality. Recall that Maria Montessori included the sense of touch as an important component in learning (Montessori, 1912). Dewey repeatedly called for students to have direct experience of that which they were studying (Dewey, 1902, 1938). We may awaken a dormant part of our students' consciousness if we build direct experience into their schoolwork. If, as Christians believe, people are spiritual as well as physical, we may thus recognize, serve, and awaken the spiritual dimension. Consider three examples. Without a trace of Luddite lament in my suggestion, let me recommend that we could offer some measure of mental and physical health to our students by planning school activities that cannot be completed without face-to-face contact. For secondary and post-secondary students especially, group work often means simply dividing work up and emailing sections around (or using wiki space) until the project is complete. No conversation is required once the initial face-to-face meeting ends (and sometimes even that meeting happens by email). What is the direct experience in this case? It is conversation, unmediated by keyboards and screens.
A teacher told me about a social studies unit on the supply chain. The students' task was to find out where things came from, in this case, food. Students visited farms, processing plants, warehouses, and retail stores to trace how their food moved from ground to table. They had to bring artifacts from each stage of the process, requiring that they not just watch and take notes. According to the teacher (who uses this unit annually), students report understanding their food in a whole new way. They realize year to year that the food supply chain has more parts to it than they knew. They learn that whole communities thrive (or fail to thrive) where food grows. They learn that many truck drivers have children in school, some taking the same social studies course. And so on. Her point is that they do field research (in both senses) and, as a result, they feel like they have more intimate knowledge of the food that ultimately ends up on their table. They know it doesn't simply come from the store. They have direct experience.

Let me tie these examples to wonder. Regarding conversation, when students sit down to talk face-to-face they may discover the richness and magic, if I may call it that, and some of the difficulties of what humans until our own time have always known about conversation. In the second case, they will certainly experience surprise at some of the complexities in getting food to their table. In this regard, I recommend “Walking into Wonder,” a good article that lays out steps for teachers to plan and lead what the author calls observation walks with classes (Rothschild, 2004). As Rothschild describes observant walking, it can be adapted for different grades and for most subject areas.

The Contradictory, the Unexpected, the Spectacular, the Contrast

The above remarks notwithstanding, teachers will still need to look for the amazing in our curriculum contents. For some of us, that may require a new mindset. But let me name some categories that may aid our thinking. How about the contradictory? Why do people say one thing and do another? Why can two innocuous or beneficial elements, carbon and oxygen, produce a deadly compound, carbon monoxide? How can something good—salt—break down into a dangerous metal (sodium) and a poisonous gas (chlorine)?

How about the unexpected? Why do moto-cross racers—when they are in the air—turn their front wheel the opposite direction from where they are heading? Why does the Mercator map look like it does if Greenland
is actually nine percent *smaller* than the Democratic Republic of Congo? When I taught secondary social studies, I regularly built into my courses a visit to globalrichlist.org, a site where anyone can compare their annual income to the rest of the world. Just as regularly, students would report to me, "I had no idea that my $1000.00 annual earnings put me in the top 44% of the world by income." I welcome you, my readers, to type your own (modest) educator's salary into the dialogue bar on their site right now. Does the unexpected produce wonder? Yes, of course.

For many, the spectacular induces wonder. But we need to make an important distinction here. While a rock concert may be spectacular, the average school teacher lacks the budget, staff, and trailers of equipment required to induce wonder that way. And, anyway, such spectacle likely does not induce the kind of wonder I am calling for and students need. More likely, with its sensory overload, it produces a kind of frenzy (or perhaps simple amazement) more than it produces wonder. The kind of wonder I am calling for here is more likely the state we experience in the face of naturally occurring spectacles such as floods, ice storms, and lightning. Or consider waterfalls, quiet forests, or the desert. Without simply making a stipulation or declaration that this is what I mean by wonder, this actually is what I mean by wonder.

How about extreme contrasts, for example, between very large and very small? How did engineers ever succeed in building a flying robot the size of a hummingbird? Can the Andromeda galaxy really be that far away? Extreme differences between rich and poor, fast and slow and any number of other contrasting pairs can induce wonder.

The contradictory, the unexpected, the spectacular, and the extreme contrast are just some of the categories educators can employ to frame materials to invite our students to wonder. Without illustrating, let me suggest such categories as the brilliant, the counter-intuitive, or cold, heavy, strong, expensive, renewable, contradictory, unexpected, large. These are a few of the many categories we can use as we plan our instruction. My readers will obviously think of others.

As teachers who would induce or invite wonder, our challenge becomes to look at any bit of curriculum, any section of instruction, and any element of our assessment of students' work and ask if we can introduce other materials or frame the materials we have in such a way that students will be induced or invited to wonder. We also must frame our instruction
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in such a way that students have to find many things out without our simply
telling them.

CONCLUSION: RECOVERED WONDER

Every teacher, every day, constructs a learning/teaching space of one kind
or another. That space will be characterized by the kinds of qualities my col-
leagues and I have written about in this book or it will be characterized by
other qualities. My invitation in this chapter is for all of us to live in wonder.
I cannot urge that on my colleagues or readers; I can only invite. Likewise, I
am limited in my own classroom to inviting and creating the conditions of
invitation. But humans possess a natural inclination toward wonder. God
made us that way. And so I don't see my invitation as a particularly difficult
one. May God help us all to (re)discover our natural, childlike capacity for
wonder, and may God give us the courage and creativity to implement the
appropriate strategies so that our students sense the power of our invita-
tion—and God's invitation—for them to live in wonder as well.

Discussion Questions

Recollect two or three scenes where you saw students get lost in won-
der. What were some of the features of these scenes? Consider some
of these possible qualities: curricular or extraneous and serendipitous
learning; planned or unplanned by the teacher; student was alone or
in a group; teacher [possibly you] was able to incorporate
the experience into instruction.

Many teachers say that the culture of assessment puts them in a
straightjacket, preventing them and their students from taking the
time to wonder. Think about teachers you know who have succeeded
in finding time to wonder, even in the current educational
atmosphere. What are some of the keys to their success?

The second part of this chapter suggests inquiry learning as one way
to encourage wonder. Think about one section of one curriculum
with which you are familiar. Related to that curriculum,
what material, activity or strategy might you introduce
to invite students into wonder?
REFERENCES


