

# On Thinking about Teaching: A Conversation with Eleanor Duckworth

The author of *The Having of Wonderful Ideas*, Eleanor Duckworth studied with Piaget in Paris, then did research with him in Geneva before she turned to teaching, in the Elementary Science Study, and eventually to teaching teachers, tapping into their hard-won knowledge and fostering deep thinking about teaching and learning.

## **Y**our work with Piaget somehow catapulted you into the field of education?

Yes, I was in Geneva two years as a research assistant with Piaget, very excited about his studies of the nature of knowledge, which he approached through studying kids. Then I came to Cambridge, and people had started to hear about Piaget—it was the beginning of the heyday of science and math curriculum, especially in elementary schools—and I fell into a job with the Elementary Science Study and got hooked on education.

The staff were mostly people from the sciences, but there were also high school and elementary school science teachers. I was an innocent who didn't know any science. I started out being a classroom observer when they tried out their pilot ideas, and my contribution was being able to tell what the kids were getting from a lesson, because of my clinical work with Piaget. I could talk to the kids and find out what they really understood about things; and I was good at not fooling myself into thinking they understood more than they did. So that became my role.

Before too long I moved from that role to doing some of the teaching



Photograph by Anne Meek

myself. My way of teaching was an extension of finding out what the kids did and didn't understand, and I had fun extending my discussions with kids. The more they told me about their explorations, the more their understanding developed; they also heard and responded to each other's ideas.

I didn't tell them what they *ought* to be understanding, because telling people what they ought to understand has very little impact on what they actually understand. You have to put them in a situation where they *develop* that understanding—it's not going to happen from your telling them.

## **Your phrase "having wonderful ideas" implies generating or owning ideas, and ownership stands in contrast to being told what you ought to understand.**

That's the absolute key to it—owning the ideas—but not only in the sense of the emotional side of it. It's not only that you feel good that you came up with this idea; it's also that you don't *have* the idea unless you've created it. All else is just words. You can say words, you can repeat the words without the idea behind it. Does that make sense?

## **You're saying the ownership is also intellectual?**

Yes, you have to put the idea together yourself, or you don't have it at all. Otherwise, it's just words.

## **So what causes, or helps, children to have wonderful ideas?**

When I'm teaching anybody of any age, what I do is propose something to think about which has lots of scope, something they can think about in many different ways, and something it's easy to have ideas about, right from the start—and all their ideas are valid. So, for example, when I'm teaching



poems, I just have people read the poem; and then I say, "What do you notice in this poem?"

Now, everybody can notice something. Some notice the use of color; some, the use of rhyme. Other people notice that the words make a visual image—they'll say "This part makes me see a picture." Others may notice a bit of narrative. They'll say "I notice there's this little story."

The more everybody notices, the more everybody notices. Each one says, "Oh yeah, yeah, I never noticed *that*," and both collectively and individually the group builds an understanding of this poem.

### **So when you pose a topic, you don't have a preconceived answer in mind?**

Right. I do have some things I've noticed about the topic, and I often know from previous work what other people have noticed. Sometimes I introduce those things *after* the group has had a chance to notice lots of things themselves and to begin to feel that each one has something legitimate to say.

It's important to make it absolutely clear to everybody that the smallest comment is valid and interesting to other people, for example, the rhyme scheme; someone may say "I noticed that the first line rhymes with the fourth, and the second doesn't rhyme with the third," or something. Someone else will say, "Gee, I never noticed that." So they can see that no matter how tentative or timid they were about saying what they noticed, it was of interest to somebody.

### **Why is this so important?**

Because people have to feel free to say what their ideas are. In most classes I teach, certainly more than half the people feel "I'm too scared to say what's on my mind. . . . What's on my mind isn't worth it. . . . Everybody else has already thought about that. . . . It's probably wrong"—all these things. So the first job I take upon myself is to make people feel their ideas are acceptable, that what they have to say about this topic is acceptable, it contributes.

If people don't agree with an idea, it

gives them something to not agree with. They can develop their own ideas for not agreeing with that other idea. And so I also encourage people to *not* agree with each other, not in a hostile way, but in a way that accepts the other person's idea as interesting and responds with other thoughts that make one not agree.

### **But are there other conditions to encourage wonderful ideas?**

Yes. This is only the first one—and you can't do it once, and then say "Well, that's done," and then move on to the next one. You have to keep doing this one all the time. The second thing, which I've sort of already joined with the first one, is that we have something complex to think about, not oversimplified or smoothed over with no place to connect with it. For example, what if, instead of having you look closely at the poem itself, I present you a statement about "the meaning of the poem"? There's no way you can connect with that—it's too closed, too fixed.

This is what happens when everything we want kids to learn is fixed, finished, done. One kid explained this, talking about his science class, "The

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trouble is, everything's all figured out. So there's no place for me. They figured everything out already so why should I? Where's *my* place?" On the other hand, if we recognize knowledge as being partial, tentative, a matter of human construction, then every learner has a place.

### **So the having of wonderful ideas doesn't come out of passive acceptance of textbook material.**

That's right. If you want people to have original mathematical ideas in graduate school, you have to set the groundwork for them to have played around with ideas, made all kinds of preliminary relationships, to see how those lead to the next relationships. And they have to have been doing it themselves and making it their own, in order for them ever to make new connections.

### **What happens when you extend these concepts into your work with teachers? I'm thinking about the moon example in your book.**

It's a good example. There're three that I use a lot—*looking at the moon* is one, *mirrors* is another, and *floating and sinking* is another.

### **You need a preface here. These are your students—**

Yes, they're education students in university classes—most of them are already experienced teachers. I look for some subject to get them engaged in so that they can watch their own learning develop, watch themselves as learners. They need to see their own minds get engaged, see their own confusions, their own tentativeness, their own excitement. And they have to see each other's confusions, too, and how each other's ideas help them. Sometimes, of course, they see how each other's ideas pass right over their heads, and they can't connect with them. Then six weeks later they hear exactly the same idea; and they notice, well, now they can connect with it. There are all kinds of relationships in people's learning that I hope for them to see, and that they do get to see, by learning something together as a group.



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*Mirrors and the moon and floating and sinking* have in common that they're around us every single day, and we think we know all about them. We're surprised to find that—this is another element actually—everything that seems simple has depths unimagined for investigating and finding more about—*investigating* is too fancy a word—it's just *finding out about*. You just look at the phenomenon; and if you ask yourself what you can find out about it, you notice all kinds of things which keep leading to deeper understanding. So the moon may be a good one to talk about.

**But what does finding out about the moon have to do with learning to teach?**

I learned from all my scientist friends in the Elementary Science Study: if you want to help kids and teachers learn about the material world, like batteries and bulbs, or pendulums, or earthworms, or butterflies, you give them batteries and bulbs, pendulums, earthworms, and butterflies. And you let them look at them, notice them, figure out their questions, and come to be familiar with these things. You don't give them *words* about these things, you give them *these things*.

Now that's similar to the poem, too. You don't give them somebody else's words about a poem, you give them the poem.

And now that I'm teaching teachers about teaching and learning, I don't want to give them words about teach-

ing and learning, I want to give them teaching and learning. I want them to have the phenomena of teaching and learning to live through and think about, just as the kids live through and think about flashlights, batteries, and bulbs.

In my course—in the very first class—they watch me work with kids, where I keep trying to find out what the kids think about something. The teachers are always stunned by how intensely the kids are interested in thinking about these things. They're also intrigued that I manage never to tell the kids anything, and they see this has lots of value, because they see wonderful stuff is happening with kids' thoughts.

Next, they try to do it themselves, and that's really hard. It's really hard to help people think about something, with your only interventions being "Let's see now, here's another question that maybe you haven't thought about yet," without making them feel that they're on the hot seat. So they practice doing this, every week.

Then the third thing is that they become learners as a class together with me, learning about something they hadn't bargained for—I mean, after all, no one came there to learn about the moon.

**You have your own surprises for them . . .**

Yes, but let me say one thing here so the readers don't get confused. What I'm trying to teach is *understanding somebody else's understanding*, because it's important for teachers to know what their kids are understanding. It's not that I think explaining what you think has no value. But every other course does that, so in this course we rule that out.

When we're studying the moon, I never tell them what I think about the moon; but I do everything in my power to get them interested in watching the moon, interested in listening to each other's ideas about the moon, and willing to express their own ideas about the moon. I tell them to go off with their little notebooks and write down every time they see the moon, what time it is, what day it is, where it

is, and what it looks like. And the general purpose is for us all together to understand the habits of the moon.

They think they know all about the moon, but they very soon find out things that surprise them. Like, sometimes, on bright starry nights, there's no moon to be seen. How come there's no moon to be seen on a bright starry night? And sometimes, you see it tonight, and you go out a couple of hours later, and it's not there any more. And sometimes, you saw it last night at 9:00, and you say, "I'll go out tonight and see the moon again." And you go out tonight and look in exactly the same place, and it's not there, and you find it in some totally different place.

When people come back to class, again my question is "What have you noticed?" They've always noticed a great range of different things, and are keen to check out what the others have seen. Or sometimes I'm a little more focused than that—maybe people had disagreements on what they thought they saw last time—and so I'll ask them whether anybody saw something this time to support one view or to support a different view.

**So what you really do is make everybody a learner . . .**

Yes, make everybody a learner.

**Now that I'm teaching teachers about teaching and learning, I don't want to give them words about teaching and learning, I want to give them teaching and learning.**



**... and they're not operating from any pretentious base of knowledge at all. It's between them and the moon.**

Exactly right. It's between them and the moon—with a little help from each other.

**And they begin to understand learning from the perspective of a learner and then to think about teaching from that same perspective.**

That's right. And they write in their journals every week, and I—or the teaching assistants—respond to their journals every week, about their reactions to these experiences and to the readings, and then the final paper is based on their own journals. They look back through their journals to see when they were angry, when they were excited, when they were confused, when they were eager, what was important to them as learners, and what happened to make it work for them as learners. And the final paper brings together their insights about teaching and learning, as they experienced them in this course.

**What effects does this work have in classrooms?**

Well, for one thing, I think it lays the groundwork for curriculum development. Take Candace Julyan, for example—she studied kids watching leaves change color in the fall. Each kid—these are 9th graders—had three or four trees, and they went every week and looked at their trees and tried to develop theories about why the leaves change color in the fall, through the trees that they saw and documented. It's a good basis for curriculum on photosynthesis, but she didn't start with the word *photosynthesis* or anything of the sort.

Cornelia Tierney did a similar study on fractions without explaining fractions but by finding ways to get her students thinking about fractions and following the development of their thoughts; and Lisa Schneier did the same with poems, and so on. That's the kind of research that is the groundwork for curriculum work. Curriculum work has to pose questions such

as *How do you get learners intrigued by this field? How do their ideas develop once they are intrigued by it? What quirks and corners of this field keep the interest alive? When they're really into it, asking their own next questions and figuring out how to answer their own next questions, how does that go?* That seems to me what curriculum development has to be. And I'd like to point out that only someone who is a good teacher can do it. You have to know how to get people interested in subject matter and keep them interested in it.

**What I'm trying to teach is understanding somebody else's understanding, because it's important for teachers to know what their kids are understanding.**

**You've written about the importance of starting from teachers' knowledge. Could you say more about that?**

Yes. I can tell you about Claryce Evans' teacher-initiated research for an example [see p. 11, this issue]. In the Educators' Forum, which she runs, each teacher formulates a question that she's interested in knowing more about, in her own classroom, and then the group helps her figure out what she already knows about it and how to find out more.

Many of her teachers want to learn more about individual kids. One studied why a kid kept falling out of his chair. It was not a physical problem at all, but in moments of excitement or something or other he kept falling out

of his chair. She wanted to figure out why he was doing that!

Another one was a kid who would never talk—never talk in class. At the time I was running a research seminar called "Understanding School Practice," and my graduate students (all experienced teachers) became research assistants to Claryce's teachers. One of my graduate students was paired with the teacher who was interested in this kid who didn't talk. She had already tried to get help from her school system, from the psychologist and special services, and had not found helpful resources there. But together these two teachers were able to figure out what they knew, what they didn't know, what they needed to know, and how they might find it out.

For one thing, the teacher who was acting as research assistant worked one-to-one with this child, trying to figure out if there were ways in which she could engage her that would lead her to talk. Other times she just observed the child in interaction with other children—you have to do that very subtly in order for no one to know you are interested in that particular child. These teachers also did library research on other cases of voluntary mutism; and they networked in the Boston area to find other cases of kids who wouldn't talk in school and then got the teachers together.

Then the two of them wrote a paper that helped everyone understand this kid; and they made some headway with having her talk in class, so that was a fine piece of work. And that project and others have been presented at educational research meetings, like the New England Educational Research Association and the American Educational Research Association. These groups of teachers have written proposals and have been accepted on programs, and have been a big hit, actually, with their research, in this world of researchers—because nobody else knows what teachers know.

I mean, teachers have so much knowledge about how classrooms work and about kids' lives in classrooms, and that knowledge on the whole is untapped and known only to



the person who holds it. Teachers *own* the knowledge they hold about their own classrooms.

**The teacher has to be free to bring his or her entire capacity—intellectual, academic, emotional, and interpersonal—to bear on the job of teaching.**

Part of the issue here is that teachers don't take their knowledge seriously, either. So it's important to help teachers themselves appreciate that they have knowledge worth taking seriously, but it's hard. Teachers are not used to writing what they know or finding a way to write down in interesting ways what they know, so that's part of Claryce Evans' forum, too. It will help them do research, it will help them see what they know, help them to expand on what they know, build on what they know, and then write it for the field. What they write is always of interest to other teachers, and it's a good starting point for more research.

**Do you see conflict between what teachers know and the curriculum demands of the community?**

Yes, that's an ongoing dilemma; and

the more that people try to resolve it by telling teachers in greater and greater detail what to do, the worse the dilemma becomes. A community can give broad outlines on what it's important for kids to learn about, and the teacher is part of the community in establishing those outlines. The teacher can ask for help from the community, later, but the teacher has to be free to bring his or her entire capacity—intellectual, academic, emotional, and interpersonal—to bear on the job of teaching. When the regulations are such that a teacher has to eliminate his or her own intelligence and insights in order to follow some rules—that is just so counterproductive that it defeats most of what teaching is all about.

**You view teacher knowledge, then, with respect?**

Yes! The main thing wrong with the world of education is that there's this one group of people who do it—the teachers—and then there's another group who think they know about it—the researchers. The group who think they know about teaching try to find out more about it in order to tell the teachers about teaching—and that is total reversal.

Teachers are the ones who do it and, therefore, are the ones who know about it. It's worth getting teachers to build on what they know, to build on what questions they have, because that's what matters—what teachers know and what questions teachers have. And so anybody who wants to be a helpful researcher should value what the teachers know and help them develop that. □

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