

Knowledge Building Forum

MS: [00:00] We've tried to build the technology to say if we understand expertise and innovation, or the very best we understand it—we keep redesigning it, of course, because our understanding grows. But what if we could build technology that actually engaged people with ideas exactly the way ideas are done in expert teams, teams that actually are known for their innovation and creativity? What if we could take the flow of ideas and have ideas rise above that are powerful and new, important work? What would that technology look like? So as I say, that's a growing act—activity in its own right.

But here's our best shot. One thing is ideas must have a public life. That's where they grow. That's how they get sustained.

So the kids have a problem: why do the leaves change colour? Now, knowledge-building teachers are really good at listening to the problems students identify in their world and trying to say, "Ah, that's an interesting problem. It actually also fits with the curriculum." So getting students to identify what's their problem. But then, what do you think? How does that work?

You'll see this child says, "I think chlorophyll goes into the tree to keep warm for the winter." Now you might notice that might not be a terribly mature idea, but you also have to realize this is a very beginning of Grade 1 and it is a kind of creative idea. I mean, how do—I mean, you know, why do leaves change colour?

What's important is other students have ideas, too. And you see this little "My theory" marker there? That's us trying to say theory development is actually how experts advance ideas. They have a theory. They try to make their theory be coherent with all the knowledge that's known in the world. It's very hard. And at first, we thought, "Oh, young kids could never do theory thinking. That's abstract. That's for—minimally, Piaget would say high school."

But this notion that if we built an environment that just didn't say, "Oh, you have to say your theory," but it just sits, a little scaffold on the side that they use opportunistically. Not demanded, not needed to be used in sequence, not needed to be used at all. What we discovered is, Grade 1 on, they like to say what their theories are.

And you'll notice one of the other supports is "I need to understand." Here, we're trying to—is it possible that instead of always having the teacher say, "Ah, what you need to understand is," young students would be telling you what they need to understand. So it's this trying to build an environment that takes them being able to identify the gaps in their knowledge and set them forth.

Well now, I'm back to "My theory. I think chlorophyll goes into the tree to keep warm for the winter." Another rather creative idea. The notion is these all live in a space and the students you'll see have many different ideas, so they read each other's ideas.

Now comes the second point of great anxiety in many classrooms, because what is going to happen if children read all these naive ideas? We're going to pool(?) ignorance? The kids are going to get more ignorant, not learn at all, and ignorance is going to breed ignorance. So this starts a kind of fear. But I also want to make this point that knowledge-creating organizations, we all—I mean, every scientist in the

world, every theorist of any sort, has had their ideas improved. Idea improvement is what it's about. So getting the notion, these ideas will be improved, and the students themselves will know that and take the ideas to the next level. This is absolutely critical.

So you'll also see the word "chlorophyll" is highlighted. This particular teacher built a scaffold with the terminology, the—the vocabulary that she thought the students should use. So teachers work really creatively to bring the—the—the knowledge, the expertise, into what the students are doing.

Here's another pretty cool idea, that the—the sap actually—there's a connection between the leaves and the roots, and the energy about what makes the leaves fall off the tree **[05:00]** has to do with the root system. I just have to say because this is one of my favourite things. This is now September, October. In the spring, completely different unit, not at all associated with this, the kids go to a maple tree—to a—they tap the—the tree at a maple leaf farm. And this child, nine months later, so this is abstract thought for sure; this child goes, "Ah, my theory's got to be wrong: the sap's not green."

[Laughter]

So that's caring about an idea for a long time and holding onto it for quite a while.

Okay, the hard part. What I want to argue is, that's creative. That's nice. But getting kids' ideas out, this is actually the easy part. What's hard is, what do you do when you have all of these ideas and we're really trying to learn the science underlying this?

So I'm not—I—I can't tell you all about the hard part. All of this is—is challenging. But the idea is that ideas do live in a public space. The students can create new views. They can use what we call rise above notes, those little notes with leaves. They start putting things together. They find evidence. They don't have so many scattered notes. They centre in on a few more important notes.

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