

The East Side Institute Presents: *An Exploration of the End of Knowing*

Sunday, June 23, 2019

A webinar with Sugata Mitra and Lois Holzman

NOTE: The following is an edited transcript of a 90-minute webinar featuring Sugata Mitra and Lois Holzman and moderated by Janet Wootten, which drew 87 registrants from 13 countries and 13 states across the US.

Janet Wootten (JW): Welcome everyone! The East Side Institute is “ground zero” for the End of Knowing — a place and space for developing alternatives to the knowing paradigm. We’re a non-profit education and research center, founded in the mid-1980’s by the late public philosopher, political activist and community organizer, Fred Newman and developmental psychologist Lois Holzman. We lean heavily on play and performance in an approach to human development known as social therapeutics. Challenging the epistemological bias of psychology, we have evolved a psychology of becoming. Our work responds to a global development crisis— a slowdown/stoppage of emotional, intellectual, social, cultural development. We put the advancement of human development front-and-center in our engagement of distinguished thought leaders and seek to bridge the chasm between the academy and grass-roots community building.

Sugata, thank you for joining today. Many of us in this seminar once buzzed around a large computer screen to learn about your work. This was well before TED made you famous by giving you its inaugural TED Prize in 2013! We were thrilled to find a kindred spirit who was developing (in our vernacular) “non-knowing growing” — reaching out to kids in some of the world’s poorest communities and demonstrating their capacity to accomplish amazing things. We marveled at the brilliance of your work.

For those of you becoming acquainted more recently, Sugata Mitra is a theoretical physicist and professor of educational technology at Newcastle University in the UK. In a recent podcast “Aprendemos Juntos” (“We Learn Together”), Sugata shared the rich history of the Hole in the Wall Project, begun in 1999, and his work over 20 years to build Schools in the Cloud in India, Australia, the UK, Spain and SOLES (Self Organized Learning Environments) organizations across the globe. We look forward to his new book, coming this fall, which chronicles these achievements: “School in the Cloud: the Emerging Future of Learning.”

Lois Holzman, the Institute’s co-founder, is chief organizer of the Performing the World conference and community, a renowned Vygotskian educator, activist, researcher and scholar. Her early research at the Laboratory for Comparative Human Cognition at Rockefeller Univ., looked at how kids learn in groups; and among more recent projects, her “Thousand People Speak Out” reports on conversations with ordinary people about mental distress and psychiatric diagnosis. Her books include *The End of Knowing: A New Developmental Way of Learning*, with Fred Newman; *Schools for Growth*; and *The Overweight Brain: How our obsession with knowing keeps us from getting smart enough to make a better world*.

Lois was writing *Schools for Growth* (one of my favorites), published in 1997, as you, Sugata, in New Delhi, were breaking a hole in the wall between the corporate research facility where you were teaching and a slum where kids were playing. Together — and a continent or two apart — you were breaking ground on new ways to approach education and development.

I see the two of you as conceptual revolutionaries who share a passion for eradicating inequality and poverty. As people who have, quite controversially, taken on knowing as the primary way of relating to our world — and in doing so, branded schools' focus on acquisitional learning “obsolete.”

Sugata, I'm reminded of your comment, “it took 10 million years for nature to make the apes stand-up and ten thousand years to make knowing obsolete!” And, so it is. You're both concerned with self-organized zones for learning and development — with relating to kids “ahead of themselves,” with fostering philosophical activity, asking questions that are unknowable and, perhaps, unanswerable. You're focused on process over product: the bustling confusion of the SOLE; the chaos of the ZPD. Both of you have challenged the authoritarian mode of traditional schooling.

My role? I am a remnant of that educational tradition in my role today as 19th century timekeeper. I will also be sitting on your “Granny Cloud” — appreciating you, applauding you, with: “That was so clever! Do tell us more!”

Groups!

JW: One of the things that I am very interested in is the centrality of the group in both the SOLE and in the ZPD (Vygotsky's Zone of Proximal Development). How do you see the activity of the group. Is the group leaderless? What does its growth look like?

Sugata Mitra (SM): I didn't actually know very much about groups when I first started working, because I came out of the formal educational system of the last century. Learning was something that happened individually and that you *received* from an institution, teacher, or whatever. When I did the *Hole in the Wall* experiment in 1999, there was no institution or teacher — just this computer and the children. And because there was only one computer and many children, they formed groups.

I repeated my *Hole in the Wall* experiment in many locations and with different densities of children, and noticed that in those remote places where only one child at a time would come to the computer, nothing much was happening. Whereas, in the slums of New Delhi, with 50 children fighting over one computer in the wall (some couldn't even see the screen!) marvelous things were happening. That's where I first glimpsed the idea that there is something in a group that amplifies learning.

I did experiments with small groups and big groups, inside school and outside school, and I discovered that groups of 4 or 5 children would produce the most significant learning outcomes in the self-organized learning environment that I was setting up.

My background is in the natural sciences. I had not heard of Vygotsky. Only later on, I realized that I should have read him a long time ago! Groups were central to the whole process, and the question at that time (and still is), why is that so?

Lois Holzman (LH): Sugata, like you, I didn't have any experience, knowledge, or study of groups. I also came from outside education, from studying linguistics. My first interest in groups grew from that, as a linguistics and cognitive-human development researcher. Even before I read Vygotsky, I understood that becoming a speaker of a language was a social activity. You can't do it alone. And not only can't you do it alone (because you need someone to talk to you), but that's how it actually happens.

It wasn't until I started to work closely with Fred Newman, who was co-founder of the Institute and my intellectual mentor, that the idea of groups came into being. Because group psychology was in the 1970s, 80s, 90s (and in some sense still is) a field that gives groups a bad name — from Freud on. Characterizations such as the 'group mind', or 'mob-mind,' promote the primacy of the individual. It wasn't until I started to become a community organizer and a participant and developer of Newman's Social Therapy (a group therapy) that it came together for me the idea the group as a separate entity — a social activity and something other than the sum of the individuals that make it up.

SOLEs and ZPDs

JW: Sugata, you've described self-organized learning as something set in motion by a teacher asking a big question. Kids (of mixed ages) are free to buzz around and chaotically explore online. Lois, you talk in a Vygotskian sense about the activity of creating the zone of proximal development. How do you see this activity within the frame of the "end of knowing."

LH: In the end-of-knowing frame, it's something that Fred Newman and I coined as "tool-and-result" learning, using a phrase from Vygotsky's writings. You don't know how to do what you are doing, and you (like infants and babies) you don't *have* to know how to do what you are doing. And, indeed, parents in creating ZPDs for the kids to play and perform "a head taller" don't know that they are doing that either. They are loving, appreciating and developing their kids, but they don't *know* from zones. They are setting up an environment where play, performance, emotional connection and curiosity can thrive.

That's how I see what a SOLE is. You are not controlling that; rather, you are giving input to it. We call it tool-and-result, because it's in the creating of the space, where the result, the answer, the activity, the growth, and the learning occurs. It is not acquisitional, it's not somebody saying,

“you will learn this!” The kids themselves create the way, the activity, and the environment to use computers and explore any the marvelous questions that Sugata puts to kids.

SM: It’s so interesting to hear a psychologist’s take. It’s amazing. What I can add is from my purely observational point of view in a very specific situation.

Firstly, only one child will handle the mouse. The children quickly learn that there is no point in trying to take away the mouse from this kid, because then there will be a fight and nobody will have control.

So, instead, they start directing that child with the mouse. And then maybe a little girl will say to this little boy with the mouse, “See that red spot on the right-hand corner of the screen? Go there!” So, the child goes there. So, he gets this arrow pointing at the little red sign. And then the little girl will say, “Well, do something!” So, he would press everything that he could find. And then something will appear on the screen. It doesn’t matter what. (Most of the time, it was an error message.) And all the children will gasp and say, “Look what you did!”

I would stand there and watch this and think to myself that they are actually grasping the structure. Gradually – in just a matter of minutes or a couple hours – they would know that there is a button called “yes” and a button called “no,” and then the error message, and another button called “wait” and a button called “continue.” They didn’t know what these buttons meant. But it took them only about a half-an-hour to sense what those things were doing. They knew that clicking the cross closed the window, and they didn’t want that. So, their language starts to change. The “advisors” to the kid with the mouse now say, “close the window.” And that took less than an hour! I thought, this is a “lesson,” and it’s come from nowhere. It just happened.

It appears unbelievable that by the second day, you would find that they are actually playing a game. And it was very frustrating for me because I couldn’t observe 24/7. In one instance I used a camera, because I thought that I must know how they are going about this. Well it didn’t work.

Magical & Mundane

When I looked at the footage, students had spent most of their time turning to the camera and making faces. So, I had to go by the results that I saw from day-to-day observation without knowing the intermediate mechanisms. And that continues until today. Inside classrooms across England, the US and Spain, teachers would say, “How did the kids get there? Shall I stand by and watch every move?” And I would say to them, “the moment you do that, they won’t get there.”

The group operates by educated guesses which they refine as they go along. And I’m sure Lois will have a theoretical framework of how that actually works. They build the structure inside their minds — similar I suppose to what babies do when they learn to speak. We can’t go in there

and observe every neuron firing. It's frustrating. We don't actually know the micro-processes that are going on inside. We know the macro only.

So the groups, the conversations, the constant experimentation, the unwillingness to give up — all happened in the absence of supervision. You bring supervision in, it stops. That's when I began to get this feeling — the rather uncomfortable feeling — that the presence of the teacher was hurting the learning process.

LH: I love your description of that first computer in the hole in the wall. I call that process that you described not only "tool-and-result," but developmental learning. In Vygotsky's language, the only learning worthy of its name is developmental. Learning and development happen simultaneously, and they are not quite explainable.

I see the zone of proximal development, or the creating of these zones, as both magical and mundane. It's the simplest thing. It happens 5 minutes after you say, "Do something with that red dot and the arrow that's next to it." And it's magical.

And as you say, once you bring supervision in, or once you bring observer in. once you try to explain it, you are distorting what it is.

It's okay for me that we can't get at the the micro-units. I'm not frustrated at all.

Chaos & Order

JW: Sugata, I am eager to hear what you think about this notion of the SOLE activity as both magical and mundane. You've been fascinated by murmurations; something that we see with swarms of starlings or schools of fish. Somehow, out of chaos, the birds and fish come together in an amazing patterned order. You say that perhaps for the first time in the history of our species, we humans too are murmuring. WIRED magazine explains this in terms of our "inner fish." (!) I'm wondering how we avoid the trap of that sort of simplistic, reductionistic way of talking about this and allow ourselves to be in this magical/mundane space.

SM: The whole idea of murmuration came much, much later in my work when I was looking for a mechanism by which all of this happens. Although I couldn't observe the children by coming very close to them, luckily children are usually loud. So, I started listening. I got a glimpse of a method which I couldn't even put a name to (perhaps theologians have one).

In those days, when you clicked on an icon, an hourglass symbol would appear. Indian street children don't know what an hourglass is. But, they have seen something similar. One day I heard a child say to another, "the drum has started." I couldn't quite figure out, what drum? He said to me, "when the *damaru* plays, something happens."

We have a god, Shiva, who has a two-headed drum that looks just like an hourglass. The children had made up an allegory: If Shiva plays his drum, then something is going to happen. I wondered if making up stories about supernatural things was the way that knowledge developed.

I kept observing to see what happened to this analogy. After a few weeks, they no longer talked about Shiva or his *damaru*. They said “the program is starting.” What made them jump from mythology to literal description? They still didn’t know what a computer was, but they had made a conceptual leap. I couldn’t help but thinking that maybe the analogies, allegories and fantasies somehow *collapsed into meaning*. The notion of “collapsing into meaning” is what first started to trigger the idea of order coming out of chaos.

Back in 1979, when I was a Ph.D. student, I heard a lecture by Ilya Prigogine discussing how chaotic systems collapse into a state of order. 20 years later at the Hole in the Wall I remembered his words and I thought, that’s what’s happening here.

This chaotic mass of information that the children are dealing with is occasionally collapsing into order, they’re flocking like birds. Then I started thinking about murmuration and of course it’s mind blowing. Individually one bird or one fish can’t do very much, except fly or swim around. But when you have 10,000 of them swimming together, sometimes they begin to form a synchronized pattern; and some time when you have a random gust of wind and little particles floating around, suddenly all that forms a tornado. Who made the tornado? Nobody did, it just happens.

And I believe that this sort of process happens with children. Education, the whole process of learning, can become so easy, if you set it up right and wait for order to appear. Prigogine won the Nobel Prize prize in chemistry to the murmurations of children of The Hole in the Wall in a slum in New Delhi.

The Language of Physics and the Language of Dialectics

LH: What is the relationship between the language of physics and the language of dialectics — Sugata’s language and my language? I was just thinking about that in relation to this notion of order coming out of chaos and I agree. I think that’s magical as well as mundane and crosses species and as you said, other aspects of nature. It really is bringing something new into existence: there’s the not knowing, the chaotic, no order — and then somehow, through a magical process that is environmental in the natural world (but also cultural in that we human beings have so transformed the natural world), that something new comes into existence. The tornado is something other than whatever makes up the tornado. The activity of speaking in the language of computer programs as opposed to the Shiva story is something new that came out of *the joint social cultural activity* that the children were involved in. How does that sit with you? Would you rather not have something new attached to the order that comes out of chaos?

SM: It is an amazing question and a question to which I don't think I have an answer; I don't think anybody has a real answer. Because of the science we have, we have all drawn to be reductionist, so when we see a world of chaos, when we see murmuration, when we see a tornado, we want to look at the individual little forces. Our mathematics fails us completely, we don't have a math, so they give it a name. When things connect to things in very large numbers, so that a change in one thing will change everything else and the change in everything else will change that one thing simultaneously, we call this a *complex dynamical system*. How does a complex dynamical system work, unfortunately the answer is we don't know. Maybe one day we will have math for it, or maybe one day we'll find that we don't need a math to explain this.

This whole idea of "knowing" — is it a collapse of chaotic information into order? When that happens, do we say "I know?" When you learn how to ride a bicycle, initially somebody holds you; you fall a number of times; you analyze it..."oh if I'm falling I should throw my body to the other side," but of course you fall again, and so on, until one day you ride. Then you say, "I know how to ride," and if I ask you, "oh Lois you know how to ride the bike now, tell me all about it," the only thing that you would say is "I can't tell you—because I know, but I don't know *what* I know." This is so typical of spontaneous order coming out of a chaotic system: you know, but you don't know how you know or what you know. You just know.

LH: Or...you *just do*.

SM: Yeah, or you just do!

LH: You do. But the way the knowing paradigm socializes us is for us to say, "I know how to ride a bike." Or it could be that you don't know how to ride a bike. You do ride a bike.

SM: Yeah, exactly. Oh, okay, good point there, good point that the word itself could be a construct of the reductionist mind — the notion that if you or if I can do it, there *must be* something called "knowing" that's happening to me

LH: Exactly

SM: That's brilliant Lois, thanks.

Doing What You Don't Know How to Do

JW: I'm appreciating how we're bringing together the being/becoming dialectic and the concept of the complex dynamical system — very different lenses for looking at the nature of being / becoming, qualitative transformation and emergence. One of the focuses, Lois, that you've had in so much of your work with ZPD learning environments (learning that leads development), is the focus on play and performance. Sugata I'm sure that this is what you've seen as you watched kids "sole-ing," can you speak to the role of play and performance, and maybe even pretense?

SM: Play to me, the kind that children do, is directed toward either an unknown goal or a goal that children don't know how to achieve. "Let's go down that path, and see what's there," could be a part of play. Or, "I'm going to hide and you find me," that would be play, or "let's take these blocks and build a pyramid with it," that would be play. What does it have to do with our minds? Well, children do it all the time, so I could make an assumption: it must be important because otherwise it would not be there inside their brains, this desire to play.

We don't stop playing as we grow up, there isn't a point in time after which we say, we don't play anymore. It's just that our games change; what we play with changes, but we keep playing. Unfortunately, we dare not say that we're playing, so we say we're planning, we're executing—we're doing anything but playing. Coming back to your question, what is the role of play? It must be important because otherwise it wouldn't be there in our heads, and it doesn't seem to go away with time. It just gets disguised, maybe we should take that disguise off, and maybe that's what the educational system should do.

LH: I would like to go back to Vygotsky, who talks about the kind of play children do, which is without setting rules beforehand. "Let's make a pyramid." The rules of making that pyramid come into existence with the making of it in tool-and-result fashion. As we get older, we learn how to play games where there is a goal set beforehand and there's a winner or loser. Those kinds of games dominate. We're in control of the playing, but we're not in control of *what it means to play*, since what it means to play is to win.

I don't think it's simplistic to say that scientists or political leaders are playing games, it's just that the games they're playing are problematic, for obvious reasons, but also fundamentally in the Vygotskian sense that they know how to play and everyone thinks they know what they're doing.

Those first early games, games of free play, are playing without knowing what you're doing, and that's how something new gets created. So many people are not willing or supported to do that. Your work is so wonderful, because what you do is support the kids to do what they don't know how to do, and more and more the adults that you involve too. How is a granny supposed to talk to a kid in India? She doesn't know how to do it, but she does it, and the kid in India learns how to speak.

Questions:

Q (Canada): Fascinating to have the science and psychology in the same ballpark, talking about games and play. We're talking about how groups function and how they formed, and how people in groups treat each other...You talk more about this idea of collapsing information to a simple enough piece of information that we can express is as in play...

LH: I can speak to the kinds of groups that I and colleagues of mine have worked with...First of all the more heterogeneous the better, because then you have more elements with which to create something new — to create the ZPD. Some people are skilled, some people aren't. Even in groups that appear to be homogenous, they're very different in terms of what they bring to it, not only what they bring to it in terms of their talents and experience and what they do and don't know, but what they bring to it in that moment: i.e., the subjectivity in that exact moment...One of the things I'm so passionate about with play is that you can play with even hurtful things, things that cause despair. Playing with them gives you a new vantage point with which to engage.

SM: Coming at it from an observational point of view, lets jump to the Self Organized Learning Environments which I work with today inside of schools. What happens there is that, in a classroom you may have 5 computers with big screens that everyone can see and 20 children. You don't have to tell the children to make groups, because what are they going to do? The average is always 4, which is the perfect amount of people to share the screen of normal width.

Only one child can handle the computer, because there's only one mouse. One of the other children advises what he should be doing. The third child is taking notes, in case they forget something. I haven't understood the role of the 4th child yet. He moves around very quickly back and forth in front of the screen continuously disturbing the children, despite them telling him to stop. But he is very essential to the whole process of self organized learning, I don't know why. It reminds me of Shakespeare, of the guy who pops in for comic relief.

Now, you might say these are fixed roles — but they're only fixed for a particular SOLE. The guy who was the operator yesterday may be the adviser today. They've changed roles. I don't know by what mechanism they've come to this conclusion of who should be playing which role on a particular day because I can't get up close enough to them or to their minds to figure out how this decision is taken. But the decision is taken very quickly.

Within a matter of minutes the groups form. Then the groups start to interact with each other. So one group of four children is overhearing what another group of four children are doing and they will yell out and say, "That's wrong! We've already checked that website. Come and take a look at this." Now this is very healthy, and it doesn't happen in school. In school, it's not considered good manners to go across to another student and say, "You've done that wrong; let me show you how to do it right." But in a SOLE, that happens all the time.

This *mutual self-correction* and *these four roles* that exist within each group seems to be the essential components of what eventually creates the spontaneous order, which is one single piece of knowledge.

Disrupters

Q (Oakland, CA): I'm fascinated by the role of the fourth child. The words that came to me is that we're *connectors*; we stop the group from thinking they know. We stop the group from thinking, "this is the answer." We sort of disrupt that energy so that people have to stay open again. And secondly, I turn 70 this year. For many, we're at a point when we are letting go of knowing. We recognize we have no control over almost anything, and we're open to having fun again. So I'm seeing some of the characteristics of children. Many elders are motivated by their grandchildren to move "not-knowing" forward.

SM: I like the idea that you appreciated the disruptor, as you called him, or her. I got a clue about what that role is for. I once did an experiment here in Gateshead, England. I did an experiment in a school with self-organized learning; and then the teacher and I decided that we would wait for three years, and then ask that same 3-year-old question to the same grouping of kids, but this time without the internet and see how much they'd remember. Their recall was actually significantly better than their recall at learned lectures-- you know the kind of teaching that goes on in normal school. But, this kind of self-organized learning-- because they've done it themselves I suppose — seems to produce *photographic recall* of that day. I asked the little girl who was giving me the details of some very complicated electromagnetic subject, "How on earth do you remember this which you did three years ago?" She said it was because of him (the disruptor!) "Remember he was disturbing everybody? He was poking me with a pencil when this thing about electromagnetism was on the screen, and that's why I remember it."

I would have never thought because the disruptor poked her with a pencil she remembered the point of learning at which this happened with photographic recall. You know, Lois-- the brain is a strange thing.

The second bit is about elders, and yes, I am headed toward 70 myself. I seem to notice that it's actually good news all the way. You know it was good news up until the age of about thirteen, from about six to thirteen were the golden years. And then comes the time when you stop working, or you stop getting paid for working. That's when you retire, and that's in the mid-sixties, 65 or 66 or something like that. (Well, now a days, nobody retires.) So now, what happens? Well, first of all, you're sick. That's unfortunate, but it's a part of nature; so you spend a part of your time being sick. But the rest of the time you can have fun. Why? Because all those years when you were working, you we're not supposed to be having fun. Just a bit. From 5 to 6 o'clock every evening in the pub - but no other fun. Sorry. So from that to the shift in the sixties- late sixties to the seventies: you can say say, "How about a bus trip 100 miles away?" And why not I have an ice cream on the way? Well, why not? I'm taking all those pills anyway. So it's another world. Yes, I think you can do SOLEs with elders.

LH: Absolutely.

The Hole in the [Elder] Care Home

SM: I have done a few of them. One I remember was in Manchester, England, in an elder care home. They called it “the hole in the care home,” and the topic they discussed was Brexit. I said, “Look you’ve got computers, this is how a SOLE works. Get on with it.” I remember one instance where one of the ladies in the group said to the man, “you handle the mouse, ok because my hands shake a lot. But, don’t use your brain because that doesn’t work and mine does.” That’s how the SOLE proceeded. So they were so very much like the eight and ten year olds in their approach to the problem. They too wanted to play, and in the process of playing, reach somewhere interesting and important.

LH: I want to respond to the disruptor thing too, with a different lens. It’s interesting that we call that person a disruptor. But what if we look at the entire scene as a performance—like a stage performance—even though it’s not on a stage. The characters have created the stage, so then nothing is disrupting. It’s a character who is doing something different.

We did a lot of research on this in classrooms and in outside-of-school programs based in performance. So you have a teenager in an English-as-a-Second-Language class who storms out of the room. Now you could relate to that as a disruption of the classroom. Or you could relate to it as the teacher did—a trained actor and teacher in a performance model—as “Oh, now we have a new character. We have a new scene.”

When there’s a siren wailing outside, you can relate to that as disrupting what’s going on or as the siren is a character in the play that we’re creating right now. I think that the overly cognitive, overly knowing paradigm and way of understanding and experiencing the world has us treating that person as a disruptor. While in fact for the kids, that little girl who said, “he poked me,” it’s the whole scene. It’s the whole thing. It’s not disruptive for her. I think that’s such a beautiful example of the performance way of looking at something.

And finally in terms of the elders- I am well past 70, and I can tell you, you know it has it’s great points and in the way that Sugata was saying, and you were saying about freedom. And you could look at the Institute’s website to see the many programs we’re doing, but even more important than that, programs with dance, and with theatre, and with exercise, and with music are happening around the world to support older people to play.

Q (Colombia, South America) Talk more about the role of the connected computer in the learning process. How is a connected computer different than, say, a piano in the learning environment?

SM: You are doing brilliant work with SOLEs in Colombia. I want to focus on your second issue, about the piano and the computer, It will lead us into our title, “The End of Knowing.” Back in 1999, I meant to see if children can teach themselves to use a computer without any assistance from grown-ups or from courses, etc. Imagine the same experiment had been done, not with a computer, but with a car, you know, an automobile. We all know what would have happened, we would have heard a loud bang and a crash. I guess, it is not unreasonable to

suppose that is what would have happened. Why? Because, somebody would have figured out how to turn the engine on, somebody would have tried and found out how to push the gear lever forward, and press the accelerator, and would have instantly crashed. Why? Because the car doesn't react, the car doesn't tell you anything. You do things to the car, and the car just responds and reacts and does what it has to do.

The computer is not like that. When you do something to a computer, the computer responds back with a program, with a video message, with a sound, with a beep, with a whatever. When you press the wrong key on a piano, the key doesn't come back to you to say, "I'm the wrong key, you shouldn't have pressed me." But the computer does, so, that was the reason why the hole in the wall experiment went the way that it did, because we had an interactive machine and the children loved that. Children love it when the toy they are playing with responds back to them. They would even personify the computer and talk to it: 'You don't know anything, you're really stupid.' Children say that all the time, to their phones, to Alexa...

LH: I do that too.

SM: So they personify them. Back in 1999, the children would have crashed the car. Hop across to 2020, the car's going to say 'You don't know how to drive, your legs are too small, would you like me to take you somewhere? Where would you like to go?' The child no longer crashes the car; the child will actually reach a destination that he or she wants (or a group of children), as much as they did with the computer, in 1999. Why? Because it will no longer be necessary to know how to drive. The end of knowing.

SOLEs Everywhere

Q (Thessaloniki, Greece): I work in a school for children with special needs, and I am also a psychotherapist. I was wondering if there are other ways to make Self-Organized Learning Environments without using computers, or without putting a computer in the center of this whole situation? An example from my village: a project that the children wanted to do — they created Olympic games, where we throw sticks and stones, we played backgammon and other things like this. Are there other ways of inviting kids to be creative in ways that are self-organized?

LH: Well, I think yes. Taking the liberty of expanding Sugata's conception and practice that came from what he was doing and what he observed of a self-organized learning environment — we can look to all kinds of activities as self-organized learning environments, or developmental environments or learning and development environments. You do that in both your theatrical work with kids with special needs, when you create and devise and perform in plays, and also in therapy.

Fred Newman pioneered Social Therapy as a self-organizing emotional development group. It's the social therapist saying to a group of people, I'm here to assist you in any way I can, but your

job is to create this group so everyone can grow emotionally. It a perfectly accurate according to my understanding of a SOLE.

I think you'll find them [SOLEs] all over the place. The beauty is that we can facilitate people creating them and recognizing their power in doing so.

SM: First, I agree with Lois. Self-organized learning environments don't imply a computer or the internet. But having said that i would like to raise a couple of cautions. A typical exercise in school could be that you have a table and a bucket full of Lego blocks. You take some children and say "Can you build a car or a cart with this?" So it would appear that you get self-organized learning environment: the children would pick up the Lego blocks, and it is creative. It appears to have all the components of a SOLE.

But now imagine the same experiment being conducted in another school, lets say a rural school, which doesn't have any Lego blocks. You take the children out into the playground and you say, "Can you build a cart?" The children will say "what?" " A cart, you know with wheels and it moves." "Oh," they say, "but how do we do that, and with what?" And you'd say "Oh I don't know, I just thought I'd ask you, can you build a cart ," and then leave them.

The second example, according to me, would be the real heart of the self organized learning environment. It involves creativity of a different order of magnitude beyond that of the bucket of Lego blocks. So I leave you with an example from a math teacher in Mexico. He came into a class and said, "I've been reading Sugata's Mitra's work, and I'm going to try an experiment." He put down on the center of his desk a huge pile of coins. He told the children (who were very young), if all of you could have the same amount of coins, the same value of money in half an hour when I come back, then you can keep it." Forty-five minutes later the children had understood (in a spontaneous order kind of way) what division meant. I thought it was a brilliant example of how a SOLE was done with nothing and with a very tiny but tangible reward.

Back to the question, what's the difference between a connected computer and a disconnected computer? You know what the difference is? The disconnected computer is like a bucket of Lego blocks — and what's put into it is what you thought would be useful. The connected computer is like the playground, if you see the difference, I think you understood the essence of the SOLE. Let me put it this way Sanja, you could bring a lot of potted plants in the room, and say this is as good as the playground. But you know and I know that it isn't. So keep the internet wherever you can get it.

Q (Canada): I have been a child psychiatrist for 40 years. And one of the issues that we all deal with is the hyperactive child, so called. I am very much against diagnosis. I've noticed that these children are often very bright. They make connections, but the connections that they are making are not necessarily the ones that the teachers or the parents are wanting them to make in that moment. So, they are considered to be hyperactive and therefore diagnosable. In a self-organized learning group, it's probably necessary to have youngsters like this — especially

when you gave the example about them as connectors — having the ability to be thinking out of the box. These kids will dig and get at something if something is meaningful to them.

SM: I think it is very important to address that in whatever little time we have left. You know, when I say “end of knowing,” it doesn’t mean “end of knowledge.” These two words are very different. People sometimes say “Sugata Mitra has said knowledge is obsolete. Of course, I haven’t! I said knowing is obsolete. Currently, for the first 17 years of our lives, we are taught stuff until we have a head full of knowledge, which we are supposed to use just in case if we ever need it. Bits of poetry, bits of math, bits of science, bits of this and bits of that. If you think back to your 17 years of education that all of us here have had and think of how much of it you’ve actually used, I don’t know what you’d say. I would say a lot less than 17 years worth.

Why was it done that way and why is still done that way? Because of the assumption that you can’t carry the sources of knowledge around with you all the time. So, when you are 18 years old, we let you out into the world with a head full of knowledge that you would use to live. Well, that world is obsolete. Because now, we can carry the library with us. We can carry all the teachers on the planet with us. We can carry their voices, their pictures, their talks, their ideas.

So instead of having 17 years of knowledge that is meant for just in case, we can think of the world where we learn *just in time*. That is what I meant by “the end of knowing.”

You know when you need to know. And of course, the brain being what it is, if what you just learned is considered useful, your brain will keep it. If it doesn’t consider it useful, it will delete it. It has done that with the large part of your schooling, hasn’t it?

So, the end of knowing is not the end of knowledge. It’s just that you learn continuously as you go along, because we have the means to do so. And those means are going to get better and better with time. Right now, we’re talking about little smartphones; 5 years ago we were talking about lap tops; 20 years ago we were talking about computers, you know, stuck into the wall or whatever it is. And in another two years, it’s going to be, earbuds? Electrical frames inside your hippocampus somewhere?

We don’t need to know. I like the way a 12-year-old child in a school in London put it. I asked, “Do you like using the internet?” And he said, “Yeah, I love it. I love your method,” I said, “Do you like doing search?” “Yeah I love doing search.” “Well, what do you like about it? What do you like about data?” He said, “On the internet, you know before you learn.” To me, it’s the essence of the 21st century.

LH: Just to add to that, the work that I do in the institute with my colleagues is in the service of the end of knowing. And by that, I think of the end of knowing as being the end of that way of being in the world where you are supposed to know — before you do. You’ve been socialized to believe that everything is knowable, and if it’s not, then it’s fiction. It’s a world where you are judged by how much you know and don’t know, and you gain an identity from that.

Sugata and I are not talking about the end of pieces of knowledge, at all. In fact, one of the ways I put it for myself when I was younger was that I wanted to be a knowledge creator, or a researcher—and I became a growth creator. I understand that the developmental activity -- the thing that might help to transform people so that we can get smart enough to make a better world, including better education systems and so forth -- it's to *use what you know*, or better to use the knowledge that there is to *help people grow*, not to help people know. As Sugata has shown, we don't need to know. But, we do need to use the knowledge that there is.

JW: Well, I failed at my job as a 19th century timekeeper! I'm over by 6 minutes. But, it's sad because this conversation could go on for many more years. And I hope it does in all kinds of interesting and interconnected ways. It's so wonderful to have people on the phone who have never worked together before and talked to one another before. Thank you so much Sugata and Lois for today.

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