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Chris: Good evening, ladies and gentlemen. This is the Voice of Chinese Academy of Sciences, and welcome Prof. Ross. We have her here; and we are the group of technology for education. So our first question is, when you were a student, how did you expect the pedagogy, you know the technologies...

Ross: Yes.

Chris: ...and other methods for teaching to be improved when you were young?

Ross: Can I ask you what you mean, when I was in primary school?

Chris: Yeah, or when you were in university...

Ross: Okay, well 'cause there's a difference. By the time I got to university things were already changing, 'cause it was the 70s. But when I was a little girl in primary school, we sat in rows and we never asked questions. We did what we were told and we were very meek. And when I went to university, one of my English teachers had us take all of our chairs and put them in a big giant circle, and we had to look at each other and have a discussion. And I was totally unprepared for that, never having done that before. So there already the pedagogy was changing from the "sage on the stage" - a sage is a smart person, a scholar - on the stage, who performs and tells the students what they need to know, and then the students are tested - did they understand it - to the idea of an interactive atmosphere. So it was a total revelation for me.

Chris: And how about the technology, what's the role of technology in this kind of changing or reform?

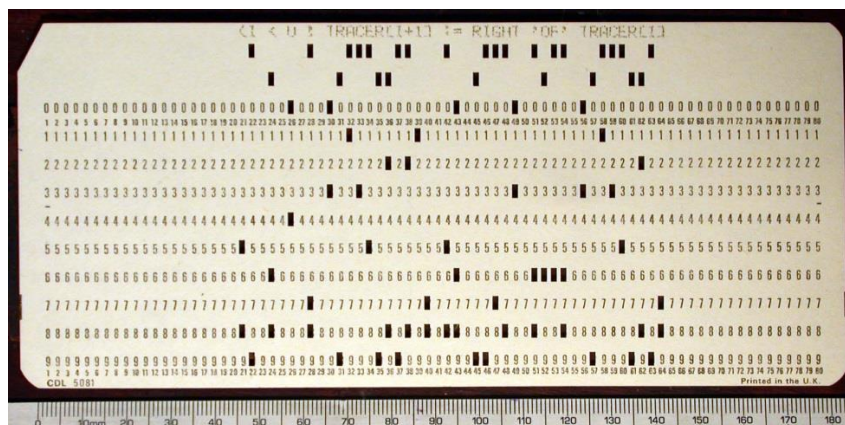


Figure 1 Cray supercomputers (above); legacy punch cards (below).

Ross: When I was in college, we didn't have computers, and the only computers that existed - there actually was a computer science club in my high school, which used [punch cards](#), if you even know what they are. And then my cousin took computer science and he had a stack of punch cards, and there was one computer in the basement of the university. He went to work in computers and he worked on [Crays](#), because there wasn't any personal computers, no PC, personal computers. So you know, I worked on every kind of software you could imagine from Custom to stuff that you [put a cup on a phone](#)

[and sent that information through the phone lines](#), so I really grew up with computing. When I went to work at the National Academy of Sciences, they did have PCs but we had to use the large floppy disks to boot them up. We used [BITNET](#) which was the early Internet to talk to people at Berkeley, but it was very, very rudimentary, very basic, so there was no technology. I can remember when people talked about [television coming into the classroom](#) and how wonderful it would be. I just don't know that that's been fulfilled, and I feel kind of the same way about some of the technologies in the classroom, that they... they have all kind of fallen short of what we really want. And I don't know whether that's for lack of money, or for lack of teacher knowledge.



Figure 2 An acoustic coupler that converts electric signals to and from sounds.

Chris: So can you imagine, you know, if you were offered an opportunity to choose a brand new technology and apply it to your class, what would be the technology? What would you choose?

Ross: Oh, I like the whole idea of having - there used to be a poster software that I use called [Glogster](#) - and I don't use it anymore, but what you do is you put a poster up, and then you can tell the students to click on whatever part they want to look at, and then

they can use that. It's kind of like a, you know, when you roll over your mouse on certain things and you have pop-ups, and I always thought that was kind of nice because all incorporated in one visual. And then, you know, as you're interested you can put it together the information your own way, always liked that. I like infographics; I would like to learn more about that, I used to do layout stuff but I'm not very good with turning data into infographics. And I think that that is something I would like to be able to teach my students with more expertise.



Figure 3 TV in the classroom, 1957.

Chris: And how do you think about the MOOC, I mean, MOOC, M-O-O-C.

Ross: Okay, when I did my education degree, my Master's degree in education in 2009, my Master's Degree said that within 25 years, high schools in the US will be partially or totally online, and that I was opposed to it. And the reason is that people don't want to pay their taxes; a lot of older people don't see young people as worth spending money on; the economy is failing, and the whole idea of online education is absolutely fascinating. And you know, with Trump coming in and the whole effort to reduce the

budget, I see more and more of that MOOCs will come to high school and possibly high school students will only go half a day. And I think that's really too bad, because I think that people should be taught by people, and the technology should be secondary. I would rather see them put more money into having better teachers and more teachers and smaller classes than I would have them put money into technology, but I do not have much of a hope. I'm certainly the outlier on that.

Chris: So you think that the popularity, the widespread of MOOC is sometimes driven by economic reasons?

Ross: Yes. You know, I can only speak to the universities that I know in the west, which are funded by students' tuition. And the tuition is outrageous - I have one daughter who just finished her undergraduate degree and I have another who's going for his undergraduate degree, and by the time you're done, you're looking at \$120,000. It's too much. People cannot afford that, and so MOOCs will have to come in because of the cost savings. But the research that I have seen - if it changes, I will be surprised - shows that online is good for boys, but not as good for girls, because the girls need the socialization. So that's unfortunate, because particularly in our fields, the sciences and the engineering, we're trying to get more girls involved in the STEM (Science, Technology, Engineering and Mathematics) fields and MOOCs are going to just turn them off.

Chris: Yeah. But speaking of this MOOC class, you see, with the improvement of technology, we have a much higher requirement for people to find jobs, and we want people to be with more abilities on technology. So actually people have to commit to

lifelong learning to confirm that they always have a better job and better opportunity on the job market. So what do you think about the influence of technology on education in this aspect?

Ross: I think online MOOCs for adults and lifelong learning are excellent, because adults are busy. They have children, you got to take the car to the repair shop or whatever, buy your groceries and it's busy. And they, and they can manage it, but they do still say a lot of people start a MOOC and never finish it. And that's a problem.

Chris: That's a problem of MOOC, or the problem of that person?

Ross: I don't know, I guess only research could decide. And then you know really, a lot of the world cannot continue lifelong learning. You know, there are people that don't have computers, that don't have electricity. So definitely the lifelong learning is for those of us who are, you know, privileged enough to be in this kind of environment.

Chris: But the society is evolving, you know, survival of the fittest.

Ross: Well, here's one of the problems that I find with the whole gap between lifelong learning and your job. In the US, the problem today is that the companies want you pre-trained for whatever it is they want you to do, and a lot of times you don't know your job until you've been in it for, say, six months. Well, the companies do not want to waste that time. They want you to come in and jump right in and know what you're doing. So there's a lot of pressure on universities and higher education to make people job-ready, and that's really unfair because students do not know what the jobs are going to be, and the jobs very, very rapidly changing. So I think there's a major disconnect. Probably the answer is in internships, and China does a pretty good job with that. I mean, they do put

students in internships and that's a big help. Maybe not so much in the US.



Figure 4 Deloitte University.

Chris: And could technology help? I mean, to meet with this kind of gap between education and the job market. How could technology help? What is your view on that?

Ross: I do think something like training, if you're in a new job, you can take a MOOC for that job. You know, almost every company has some kind of training for their technical people when they come in. Deloitte, for example, [has a whole university in Texas](#) where people go to learn the Deloitte way and get trained. So I don't have a problem with that. What I do have a problem with is replacing what we do have with technology, in order just to save money. That I have a problem with, because the socialization of human beings is really just as important as our education.

Chris: Thank you. Thank you, Ms. Ross, thank you very much.

Ross: You're welcome. It was a pleasure to be interviewing with you.

Melody: Thank you.

[Transcribed by Edison Zhang]