Welcome everyone and thank you for coming

What I want to do in this seminar is to get you to think about some of the questions that arise when we are considering the use of technology in education. I am going to argue that while it, (i.e. technology), is seen as a relatively unproblematic enhancement of educational provision its use actually raises some profound and challenging issues. Now I don’t have time in 20 minutes to go through all the ways that technology is used in education (and anyway, lists are boring to read and even more boring to listen to). So I intend to draw on the way technology is used more generally in society and ask whether the benefits it brings transfer to education, and suggest some ways in which this might be researched. My starting point is that assumptions are being made about what technology can offer education, but that these assumptions are not generally warranted. I’ll explain why as we go through, but I think many of us in education are guilty of seeing really quite wonderful advances, and thinking “we’ll have some of that”. I’m no Luddite, but I do think we need to think more carefully about what we are offering students.

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I’m going to start by considering the self-driving car. Many pundits are arguing that this is likely to bring about a revolution comparable to that brought about by the invention of the steam locomotive and the development of the railways in the Nineteenth Century. (And there’s no doubt that that was probably the biggest social change wrought by technology in history. There’s a lot of hype about the Internet but I don’t think the effect is anywhere near as profound. Not yet anyway.)

What are the advantages of the self-driving car? Most obviously you don’t need to learn to drive before you can use one. There’s a lesson for educationalists right there isn’t there? What is the point of teaching people to do something if there is no longer any need to do it? But it’s not just a matter of driving. Some people have speculated that once cars can drive themselves you won’t need to own a car. You could call one up via an app and only pay for it as you use it. So it would be much cheaper. What we have here is a different set of skills. You will have to know how to use the app, where you want to go, plan times (because the car will still have to get to you). They’re also safer. Probably. Yes there has been one well publicised fatality, but there have been thousands of fatalities and injuries in conventional cars since that incident. (Equally they’re vulnerable to hackers, terrorists – if cars are called up on demand, it wouldn’t be that hard to plant bombs in them). So again there’s a new set of skills to be learned. My point is that actually for every positive around technology there’s a negative too. (You see this elsewhere, for example in the controversies around Social Media like Facebook and Twitter. For most people they’re harmless, but there are some real nasties lurking in there.

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So let’s ask the first question. “What is the point of online learning?” Of course there is some debate about what constitutes “online learning”. We could cover simulations, online quizzes, virtual worlds, and many other things, but given our time constraints I am just going to focus on the online lesson, by which I mean the delivery of a chunk of content either through audio, video, or through text.

Slide 3 Anim1

Is it the same as face to face learning? If it is then we can see some advantages. Clearly there’s no need for a teacher. At least there is no need for a teacher to be present at every lesson. Why am I here? (I’ve suffered for my learning and now it’s your turn!) What is the advantage of a physical person in the same room? I intend to go into that in a bit more detail later, but for now I’d like to pause for a second for you to think about how you would answer that question.

Slide 3 Anim2

Obviously the first thing to think about is parity of experience. Surely it is reasonable for a student to expect the same on line as they would get in a conventional classroom and vice versa? So what do you get in a conventional classroom? First you get structure. The teacher decides what he or she would like the students to learn and organises the material in a way that, in their professional judgement allows the students to achieve the learning objective most effectively. Second, the teacher selects resources that are pitched at an appropriate level for the students. Third, the teacher can test student learning. Fourth there are frequent opportunities to review and critically analyse a proposition. Fifth there are opportunities for students to learn from their peers. I’m sure you can think of others, but they’ll do for today. More to the point is the order in which I presented those. The first is quite easy to do. In fact the text of this talk is available on my blog as is an audio and video recording. The second is also relatively easy, though the Internet allows students to choose a wider range of resources which may prove problematic if they select inappropriate or inaccurate resources. Testing learning is more problematic. It’s true that multiple choice quizzes can be provided, and, if properly designed these can, despite some popular criticism offer quite high levels of pedagogical sophistication. Even if it were possible to assess essays on line (and there has been some work on that), I doubt that any student cares much what a machine thinks about their progress.

The other side of all this is what the teacher might reasonably expect of the students. This takes us into the last two items on my list. I would argue that review and critical analysis of important points is essential to learning, and central to what most teachers do. Again, possible on-line, but it is much more difficult to convey nuances in written text. You can certainly correct errors, but computers are unforgiving and completely unable to distinguish between carelessness and ignorance. A human can use context. But I think my fifth factor is the real challenge presented by online learning. It is extremely difficult to get students to engage in a debate online, and even more difficult to keep them on track. And here’s one of my research strategies. One way I’ve thought of doing this is to deliver an online course and be very clear about expectations. It should be possible to measure the extent of student contributions and perhaps follow that up with interviews about their experience.

Slide 3 Anim 3

Which brings us to the key phrase in all this. What is “reasonable”? You’ll all be familiar with the debates about how automation has expanded the boundaries of work. (The French have just passed a law establishing the right not to answer work e-mails outside working hours). It’s true that different people have different expectations of course, but there are people who expect replies within a couple of hours. Not everyone enjoys sitting in front of a computer at 3 a.m. I do think it worth mentioning that there is considerable evidence that sleep deprivation plays a part in the development of mental illnesses. See Milojevich & Lukowski, (2016). So I think we have to set very clear boundaries. A teacher teaching online should respond to students within an agreed time frame. Certainly students should expect that resources should be made available in good time and that they should work properly if they are audio, video or other software. There may be issues around poor broadband connections here and the teacher should ensure that all students can access each resource at the start of the course. It may be necessary to make them available on alternative media. Finally there must be an opportunity to discuss and comment on all the resources, discussions which the teacher should participate in, and if necessary initiate.

So where is all this leading

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Well I hope not to this! But I do think this is the logic behind the self-driving car. If we can have cars that drive themselves why not have minds that can be filled too. In theory

Slide 4 Anim 1

Behaviourist theory, particularly the stimulus-response aspect has shown us that (very crudely) it is possible to programme minds. If a car can be programmed to stay on a complex network of roads, surely similar mapping can be built into the neural pathways of the brain. Well, probably not. In the first place the brain is infinitely more complex than the road network of the entire world, but as we move to a more epistemological slant, there is very limited notion of a correct destination, let alone which side of the road we should drive on. Yes, of course there are correct solutions to physical and mathematical problems, but social problems are not quite so amenable to an agreed solution. There are people who think they know all the answers, and would have us all follow them, but I think we can all agree that they should, in general be avoided.

Slide 4 Anim 2

The other thing is that knowledge requires effort to acquire. There is a bit of a myth, which we in education have done very little to demolish, that success is largely a product of ability, and that ability is an innate quality. As Carol Dweck (2014) has shown a much more effective approach is to emphasise the effort you put in, and to take a positive approach to failure. Dweck distinguishes between a “fixed mindset” and a “growth mindset”. Those with a fixed mindset tend to see failure as a result of their own lack of talent or ability, while those with a growth mindset tend to see setbacks as challenges and opportunities to learn. I suppose a simpler way of expressing is that putting in more effort leads to an improvement in ability, so I suppose it’s not entirely mythical. But it is effort that is the key, and I would argue that you can’t have learning without effort. And in fact, what I’d like to do know is have a brief discussion about whether you think this is

Slide 4 anim3

A bit scary? What do you think?

Slide 5

I think it is because of the reasons on this slide. I’ve chosen to illustrate this point with a picture of one bay of shelves in one library, in one city. Yet reading just one of those books will change you in a profound way. Knowledge is not a commodity that can be quantified, yet technology works best with quantifiable commodities. My worry, and what I would really like to research is the message that a focus on technology is sending about the nature of knowledge. There are no fixed boundaries where you can say this is knowledge and that isn’t. Everything is. Yes, some knowledge might be seen as more worthwhile than others but that’s an axiological position. True, some statements might be factually inaccurate. But they are relatively easy to identify. Yes there are debates about how we might interpret certain facts, but they are influenced by other facts and by values.

The point is that knowledge changes all the time. That’s what we do as researchers. We are always looking for better ways of doing things, trying to understand why things are done in the way that they are. So it’s important that we don’t just accept the promises of technology; that we remember that those who are advocating technology are usually trying to sell us something. I’m not arguing that that in itself is a bad thing. We live in a capitalist system, and whatever you might think about it, it survives through the exchange of commodities. Our responsibility is to think carefully about what we are being offered, and effectively, decide whether it offers us and our students enough value to make that investment, always remembering that we and they have to live with our decision. The people selling the technology do not!

**References**

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