

SIR KEN ROBINSON – GETTY INSTITUTE:

Morning. How are you? Okay.

I've been asked not to mention the cricket. But I'm thinking about it, that's all I'm saying. On my mind constantly. It was great, wasn't it?

Actually, I ought to thank the minister for thanking me for making the great effort. It wasn't an effort at all. Really, a stop on a plane. I was given two meals, and watched a movie. I compare that to the ten pound Poms. That was harder for them, wasn't it, really. I just sat in business class, and stared out the window. And I want to come back to that in just a minute. But I've had a great time.

I got in on Friday and ... I love Melbourne. I've been here a few times now. Actually two, if you want to be specific. And it's, I think, my third trip to Australia but it's a wonderful city, it reminds me of, actually, Manchester, curiously; by the sea.

I was brought up in Liverpool. I'll tell you about that in just a minute. But I also ... I was invited to go to watch the football match on Saturday. But it didn't work out. Was that right? The game was played in Sydney. Is that right?

I'd never watched it before, so I thought I'd watch it on the television. Australian Rules Football. Why is the word rules in there. What is that? I watched it for an hour; there aren't any, are there. I (laughs) couldn't make it out ...

But Jennifer's right. I now live in Los Angeles. I moved out there a few years ago. Have you been to Los Angeles, anyone. It's amazing, isn't it.

Have you been to Las Vegas. What's it like. Really, I spoke at a conference in Las Vegas a few months ago, November. You don't care, do you really. Do you care when I spoke in Las Vegas. Is it ... I mean, do you want me to work this out, or shall we move on. I mean, I can get my diary out.

And I spoke at the Venetian hotel in Las Vegas. Have you been there. It's amazing. I've been to Venice, and the Venetian is better.

[Laughter]

It is really; it's more authentic I think.

[Laughter]

Yeah, so ... they have canals up on the first floor with ... honestly, with people in Gondolas in this replica of San Marcos Square with artificial daylight. And you see all these people who've had these quick marriages in Las Vegas, walking along the canal. And you want to go up and say no, no, it's not real. It's not really Venice.

But I mention it, because I spoke at a conference there for about ... there was about fifteen hundred people. And I was keynoting the second morning. It was an IT conference, and a commercial thing. And the first morning was keynoted by a group called The Passing Zone. Do you know them. They're a group of extreme ...[microphone feeds back]... Cheap pacemakers, you see, that's the thing. Feedback on the batteries.

[Laughter]

It's ... I'd better start again now. Thank you for the minister. Flying out. It was very easy.

No, The Passing Zone - check them out on the web - they're a group of extreme jugglers. They juggle chainsaws. Not well. You know, but there are two of them. There used to be eight, and ... but they're improving and ... but they also juggle ... their climax act now is, they juggle members of the audience.

Honestly, they have a framework, and like trapezes, and they throw members of the audience around. Well, that was the first morning's keynote. You know, well I was keynoting the second morning. Well, I don't do that, honestly, I don't really juggle anything. But I said to the organisers, you know, that's going to happen for my opening, and they said, well, we've got this work. Do you know the musical, Stomp; you know, where they're beating on the tin cans and things, and doing percussion. They were performing in Las Vegas, so they said, we've got half the cast of Stomp, it's eight o'clock in the morning, they're going to come out, I'm ... you'll be back stage, and they're going to play a musical

introduction for ten minutes on this thing, building up to this climax. And it ended with them chanting my name. That was the plan.

So it happened. I was there, eight o'clock in the morning, backstage in Las Vegas, in the thong, you know ...

[Laughter]

You know, I'd ... I didn't need to wear it, but I'd packed it, so I thought well, you know, and sequins are expensive, let's face it. So you know, you can't just leave it there. So I was backstage, and then they all started beating these drums, and it took about ten minutes and it was fantastic, these three beautiful dancers, and these percussionists. And then they came up onto the stage and did this whole climax where they started chanting, we'd like to introduce Ken Robinson. And the climax is, these three girls came off stage, pulled me from the wings into the centre of the stage, and showered me with confetti. Honestly. Well, this is unusual, isn't it, really.

[Laughter]

You know, as a way to start to day. Anyway, I thought I'd mention it, because although I thought Janet's (ph.sp.) introduction was okay, you know ...

[Laughter]

I can't better ... that's all I'm saying, really. You know, how have a better ... it's a resource issue, I know. I can see it.

[Laughter]

Anyway, I wanted to talk to you about creativity, which you'll be very relieved to hear, since that's what the conference is about. In particular, backing it, I thought. But I ... so we're right on target. But I wanted to cover three questions with you, as a kind of way into the two days. One of them, the first one, is why is it essential for organisations of every sort, not just schools by the way, but every sort of organisation, but I'd say especially schools, to promote creativity systematically. Why is that essential. I

mean, you recognise there's an embedded assumption here, which is that it is, but why is it. Why is that now so important.

My contention is that creativity now is as important in education as literacy and numeracy, and they're connected, by the way. But they're equally important. Secondly, what's the problem; why do we have such a problem with creativity; or more specifically, why do so many adults think they're not creative. Because it's true, isn't it. I mean, you ask yourself, I mean, next time at a dinner party ... actually, if you work in education you're not at dinner parties really, are you, very often, don't you find.

I found that when I was a professor. I ... you're not asked, I found. And you're never asked back, curiously. That was the thing I found. But we always went, because we needed the food, really. That was the main thing.

Why do adults have such a problem? Just ask randomly, a group of people, next time you're dining out, on a scale of one to ten, how creative they consider themselves to be. Really, I think you'll be surprised. What I think you'll be surprised by, or should be, is that children don't have that problem. Young children, especially, believe they are very creative, don't they? Or rather, they have great confidence in their own imaginations and creative conceptions, up to a point, about seven.

But if you've got little children, check it with them. I ... I was saying ... I came across a great story about this, which I really liked, that ... I now, as I say, live in Los Angeles. We moved out there four years ago, to take up this role at The Getty. It was a kind of sudden invitation, and we left immediately, because it was raining in England at the time, and my son James came with me, and my daughter Casey, Terry (ph.sp.), my wife. And James, by the way, didn't want to. And we were living in Stratford on Avon at the time. So we moved from Stratford to Los Angeles.

So you can imagine what a seamless transition, you know, this turned out to be. I loved Auntie Joy's (ph.sp.) welcome, and I wanted to thank you for it. I can't see where you are, just now, but it was a terrific welcome. What it reminded me of, was how deep the sense of time is, with the indigenous peoples of Australia. It's one of the things that I believe we should reflect on, our different conceptions of time and space. We live in western mindset, most of us, and it varies as you travel around the world. In Europe, a century is not really a very long time, is it? Not really. You know, it's a century.

My house in Stratford-on-Avon was built in 1860, and this was one of the new developments, you know, in Stratford. We weren't sure if this would take off as a neighbourhood really. It was a bit too soon to call it.

In LA, any house that's over twenty years old is a heritage property. You know, people are brought to look at it. Children are brought up outside, and they're lined up. And their parents say, look, this has been here since the '90s.

[Laughter]

Since the last century (laughs). The thing is, after you find in LA people use the word decade rather a lot, because it sounds like century. I was on the freeway recently, and there was a commercial came on the radio. I think it was for Saab of Santa Monica. I just loved it, because it's a kind of desperate struggle to get a sense of tradition now in the west side of LA, and the slogan was for this company, and it was on the radio: Proudly serving Los Angeles for almost half a decade.

[Laughter]

Sounded great. You know, think four years maybe (indistinct) the rest. You know, whereas for the indigenous people of this land, a millennium, really, is probably hardly worth commenting on. It's true isn't it. But lots of things that are similar, and we found that. You know, the culture's very similar as you move from Europe to America.

James actually now loves it. He didn't want to come. Partly because he had a girlfriend in Stratford – Sarah (ph.sp.) – who was the love of his life. He'd known her for a month.

[Laughter]

That's a long time isn't it when you're sixteen, isn't it? They'd had their fourth anniversary, you know. Then on the plane, he was really upset. I was trying to counsel him on the plane. He said I'll never find another girl like Sarah. And we were rather pleased about that, frankly, because ...

[Laughter]

... it's one of the reasons we left.

[Laughter]

Anyway, the first weekend we go there, we took him to Malibu to the beach, and we could see the seeds of recovery, you know, beginning to ...

[Laughter]

Thought this could work. And then ... anyway, he's now at USC, University of Southern California, where he's got his own car, his own apartment, he's six foot two, striking, surrounded by beautiful women in bathing costumes and sunshine, you know. And I'm paying for it, that's the thing.

[Laughter]

So, some things are very similar and some aren't. But one thing that is very similar between Europe, and Australia, and Asia and here is that people have a problem with creativity, up to a point. And I have this great story which is a teacher taking a drawing class, just teaching ... to illustrate children's confidence. She was taking a drawing class with a group of six year old children in LA. It's a rare enough event, because the art system in California is devastated. I'll tell you about it later if you'd like, but it's a rare enough lesson. And the teacher noticed there was a little girl at the back who was completely absorbed in what she was doing. For about half an hour, she didn't lift her eyes up off the table, absorbed in it. And the teacher went across to her and said, what are you drawing. And the girl said I'm drawing a picture of God. And the teacher said, but nobody knows what God looks like. And the girl said they will in a minute.

[Laughter]

Isn't that great, don't you think, that they will in a minute. I was saying, when we lived in Stratford, James, when he was four, was in the school nativity play, and you remember the story don't you. He ... anyway, he got the ... Mel Gibson did the sequel recently, you probably saw it. Nativity (indistinct) revenge.

Anyway, they ... James was ... got the part of Joseph, and I just remembered this, this thing about creative competence. Three little boys came in, and they were the ... you know, the gold, frankincense and myrrh, and I think what happened was they hadn't rehearsed it much, so the ... they went out of sequence. So, the last boy improvised. What happened? We found out ... we checked it with his parents later on. They said, oh yeah, he did say that, yeah. It was great, because they came in, they ... the little ... first boy put the box down and said, I bring you gold. The third boy said ... second boy said, I bring you myrrh. And the third boy said, Frank sent this.

[Laughter]

Who's Frank, you know; the thirteenth apostle. Well, my point is that kids will do that, won't they. They'll have a go ... if they don't know, they'll go ... have a go, or try it. Adults censor themselves. You know, I don't know. Because we start to worry about being wrong and being foolish.

Now, I don't mean to equate creativity with being wrong, but I think the willingness to be wrong is a major element of creative capacity. And I think it's schooled out of us, is really what I want to get to.

So, what's the problem; why is this so (Indistinct) and third is what you do about it. If you really want to promote creativity systematically what you do about it. And until (indistinct) there are really three ideas I want to put to you which are embedded in all our futures and the things that Jennifer mentioned. The first is that, worldwide, I think it's true to say, all of our cultures are facing a revolution. Actually, we're in it. We're engulfed in a revolution. And I think it's moving faster and it's more complex than many people seem to recognise. Certainly to judge from the social policies we have in place.

This is a full-scale full-on no-nonsense revolution. And we don't know how it's going to fall out.

The second proposition is to meet this revolution we have to reappraise our sense of capacity. We have to think differently about ourselves and about our connections and our institutional relationships, because most of these things were forged in the nineteenth and eighteenth centuries, and they don't suit the circumstances anymore. Education is a prime example here.

And the third proposition is, to do that we have to behave differently; not just about thinking differently, we have to do different things. And I think especially this is the case in education.

One of the things that strikes me, travelling about, is the remarkable similarity in education systems. All western-derived systems, western-based systems - which actually is most of them, as you look around formal education systems - have some very striking similarities. I'll mention two of them.

One is that there is a hierarchy of disciplines in education, especially in schools, but it's projected into higher education. It's a hierarchy. And the hierarchy is this: at the top of it are languages and mathematics. They're taught to everybody all the time. And when funding starts to get tight, they're the bit that the politicians pull the wagons round. Isn't that the case. Language and mathematics. And science, in most countries, not all. Science is kind of a close second tier. Then the humanities, which are always spread out and start to drop off at the end of certain points. And at the bottom of every education system, every compulsory taxation-funded system, are the arts. Without exception.

And in the arts there's another hierarchy. Art and music, or visual art and music, are generally taught more pervasively and thought to be more important than drama and dance. Dance is probably the bottom of the list in most systems. And this isn't paranoia, it's just an observation. There is not a school system on earth where dance is taught every day systematically on a compulsory basis to every child in the way that we require them to teach mathematics. Is there; do you know of one? I don't. Not one. If dance is there at all, it's an optional thing and drops off the end eventually. Why; why is that.

I mean, if you have to leave in a minute, you know, to catch a bus, take this thought with you. Why isn't dance as important in schools as mathematics, because it should be. You know, we all have bodies, don't we. Don't we. Did I miss a meeting somewhere, I mean, don't we. Truthfully, what happens in education is we progressively educate people from the knees upwards. And in due course we concentrate on their head. Don't we, and slightly to one side.

[Laughter]

The consequence is that educa... highly educated people in our western systems, for the most part, not in every case, but as a generalisation, you will find that they are disembodied, they live in their heads and slightly to one side. They look upon their body as a form of transport for their head. You

know, it's a way of getting your head to meetings, isn't it. Which hopefully the Internet will eventually relieve us of entirely.

[Laughter]

You know, I mean, why else are we all in such a desperately poor physical state. You know, why are we so out of tune with our own physicality. Why is that. We weren't to start with; we are now.

I'm saying, if you want examples of real hard evidence of out of body experiences, go along to a residential conference of senior academics.

[Laughter]

And pop into the discotheque on the last night, you know, very good.

[Laughter]

(Laughs) There you will see it (laughs). People writhing uncontrollably off the beat; waiting for it to end so that they can go home and write a paper about it.

[Laughter]

And I say this, not in criticism of people whose achievements and powers and capabilities are in fields of that kind of discourse, but really in support of people whose capacities may not be, or may be more than that.

I used to be on the board of The Royal Ballet, as you can see, you know, this is not an accident, you know, this is hard work; and hormone patches which I recommend by the way (laughs) ...

No, I used to be on the board of The Royal Ballet and frankly, a smarter group of people it would be hard to meet than professional dancers; and especially in their extraordinary discipline, and balance, and poise. But for the most part, that's not valued. Why? Well, a straight answer is, systematically in education we encourage people to think otherwise of it.

Well, my signature theme, I suppose, is, can we please stop doing this because what the real issue here is not that it happens but that most people are okay with it. Politicians are okay with it.

And so what you find is a gap between most political systems where people say very nice things about the arts, how important they are, how terrific, you know, how they help learning and all kinds of other capacities, and then do nothing about it. So the implementation becomes a big issue. This was the theme of the last two days of this symposium; the gap between the rhetoric and the practice.

And I want to say why I think that is in a minute. So revolution and the need for new conceptions and the need for new strategies.

I have three, I suppose, areas of interest, currently. One is education. I've worked in education most of my life. And I've been struck by this from whenever I could think about it, that there was this disparity. I said there is a hierarchy. I mention there's a second feature in my view. The second feature is the insularity between subjects in school systems, for the most part. They're kept apart. You know, science is over there and arts are over here and music's over there and on the whole, people don't talk much to each other. They talk ... I mean, don't talk across boundaries. While most of us brought up to believe that science and art are totally different things, aren't we. I mean, in the British system, at the age of sixteen you have to choose which you were, you know, if you're a scientist or an artist you went down a different corridor at that point.

And the hierarchy, by the way, is impressed on higher education for the most part. If you want to practice the arts in higher education – this has been true for a long time, it's less true now as we move on, but it was true for a long time – if you wanted to practice the arts in higher education, like, do it, you went to a conservatoire where you got a diploma for your efforts in drama or music.

If you wanted to get a degree – which is always thought to be a higher level qualification – you went to a university where you didn't do it, you wrote about it; wrote about other people doing it. Art history departments, for example, hand out PhDs for writing about other people's work; not for doing it. You know, I mean, if you happen to paint an art history artwork, good for you, as long as it's the weekend. But you don't get credited for it.

I mean, the old system, you know, Picasso would not have got a PhD but somebody who wrote about it probably would. And I find this very interesting that our system is predicated on the pre-eminence of a certain type of analysis, over practice. And that's the other signature theme I want to come to because I think it stills the creative impulse in most organisations.

So I work in education, I work in the cultural sector a lot because I've always felt there was a powerful synergy between the two, and increasingly in the corporate sector. I work a lot with organisations and companies, who, by the way, are as worried about this as you are. I find this very interesting.

A lot of these narrow measures in education reform, you know, standards and so on, accountability movements, literacy and numeracy, are in what policy makers perceive to be the interests of business and the economy; are they not. There is no other reason supposed for doing it.

The great irony is if you speak to people in the business sector, they are as annoyed about this as you are, because they're getting people coming through who can't think out of a straight line. And I want to come on to this, I think it's a very powerful shift. I think we should make common cause much more with the corporate sector than we do, and see whether there are real connections there.

Anyway, I wrote a report for Tony Blair, you know, the Tony Blair, don't you. Tony Blair, when he came into office in '97 talked a lot about the importance of creativity and I took him at his word. And then I got concerned because the actual policies that were being implemented seemed to me to be antipathetic. High stakes assessment. Confusion, as I saw it, between raising standards and standardising. And I think it's a very important difference.

I mean, if you think of this in the catering field, for example, McDonald's – (indistinct) and you may like them – they're quality control mechanism is standardising. Everywhere you go in the world, every McDonald's is the same as everyone else's, isn't it, everywhere. You can gua... if you ever eat them, it's the same everywhere. They guarantee it, same bun, same everything, guaranteed. Horrible, but guaranteed, you know, (laughs). Guaranteed to be dreadful.

The other mechanism for quality control in catering are things like the Michelin Guide. The Michelin Guide doesn't prescribe what should be on anybody's menu or how it should be served, they prescribe a set of criteria which the restaurant has to confirm with to be considered to be excellent.

In education we've tended to go for the McDonald's model, haven't we, of raising standards. I think we should be going for the Michelin Guide where we specify criteria under which people can flourish according to their own forms of excellence, rather than having everything become homogenous. I think that's the great tension of the case.

So I put this report together. It's called; All Our Futures. Have you seen it? It's great isn't it (laughs), don't you think. I wrote it myself actually, with help (laughs). That was it. In case you doubt me, in case you think I'm making this up. There it is. And I'll say a few more things about it as we go on. And then I followed it with this book, which Jennifer kindly mentioned. This is terrific, by the way. Really, I mean you should buy this book. That's all I can say (laughs). With Christmas looming up, you know, the way it is.

But I've tried in the book to set out more broadly what I thought the contextual factors are that support this argument. Let me give you a quick test before we move on. Just answer this question. For yourself - I don't mean for somebody else, for you - where would you put yourself. I mean, do you think ... how creative do you consider yourself to be. And by the way, I say, there's no trick. You may consider yourself, and probably would, very great indeed. But just to make it easy, as we're talking about education, as a kind of conventional scale, and ten's at the top, by the way. Just so we don't get confused.

While you're thinking about that, answer that one. Where would you put yourself on that scale. This is a more conventional question, isn't it. I mean, we often make judgments about people's intelligence, and we're happy to do it on the numerical scale, and we think of IQ. You know the idea of IQ, essentially. You know, that we all have a certain amount of intelligence, we're endowed with it. Not much you can do about it.

We can give you a series of twenty-minute tests, and at the end of it, we can tell you what your score is, and ... or whether or not you're a genius. A neat system, isn't it? It's a complete myth, incidentally. But it's become a viral conception in education systems around the world. The reason, by the way, is it was convenient. IQ, the idea of the signs of IQ, so to speak grew up in the nineteenth century at the same time as the growth of public education systems; and in America, with the growth of the military.

And it became a very convenient way to categorise people quickly, to move them into different sorts of situation. We can talk more about IQ if you'd like, but it's a particular issue for me. Anyway, if you were willing to, put your hand up, seriously ... if you got for ten for creative, then do as you did, because no ... I'm not going to ask you to come up here and do anything. It's just ... I'm just interested. You know. Great, thanks.

Mmm? You put the hand down? What are you doing? What's going on?

Nine. Eight.

Do look around, by the way. The people on the front are paranoid. They think that every ...

[Applause]

... everybody's got ten already.

Eight. Seven. Six. Five. Four. Three. Two. One. Come on. (laughs). I know you. All right.

How about ... where was the (indistinct), by the way, down at this end?

Eight. Seven, eight.

How about intelligence? How did you do on that?

Ten. Come on, you're running the education system, come on.

[Applause]

(Indistinct) Nine. Eight. Seven. Six. Five. Four. Three. Two. I'm not doing one, I know. If I got one, you're not following this anyway, are you; am I right. You lost track of this when I talked about Australian Rules Football, didn't you?

This is the interesting question for me. How many of you gave yourself different marks for both questions. Put your hand up if you got different marks both questions. Let's have a look around. Is that ... it's a majority, is that?

Now this is what I find interesting. I mean, what I would want to argue up here, and I'll try and encapsulate it. If I had more time, I'd talk about it more, is that I think you're wrong on both counts. You're much more creative than you give yourself credit for, and more intelligent than you give you credit for. It's partly how the question's put. But also, what it illustrates, I think, is a very common view that we think of our creativity and intelligence as unrelenting. You can be creative or intelligent, high or low, one or the other.

And my real proposition to you is that creativity is a function of intelligence. The reason we think we're not very creative is because we haven't been often found part of our intelligence that answers to it for us, and visa versa.

Now I think you can develop high capacities in some forms of thinking, and be less practiced in other forms of thinking. But to see creativity and intelligence as two separate things, I think, is one of our problems. We have to connect them.

Do you want to come in, by the way? People are standing around the side. I mean, do you. Are you happy where you are? Okay.

Let me just show you something. I think you'll be interested in this. There was a book published - it was called Breakpoint and Beyond - a few years ago, about ten years ago maybe, and it reported, among other things, on a series of tests that had been done on divergent thinking.

Now, divergent thinking is not the same thing as creativity. I mean, they're not congruent ideas. Divergent thinking, here's an example of it. It's a capacity for associative thinking, you know, analogical reasoning, making non-linear connections, stuff like that.

They gave a suite of tests to sixteen hundred three to five year olds for divergent thinking; sixteen hundred of them. And they then calculated how many of these kids, according to the protocol of the test, had scored genius level or higher for divergent thinking in the way you might calculate that genius

level achievement for linear. What percentage, would you say, of three to five year olds scored at the genius level or higher for creative ... for divergent thinking; mmm? A lot. A hell of a lot. Okay. Ninety-eight per cent.

What was really interesting about the study is that they ... it was long term, longitudinal te... study. So they gave the same test five years later to the same children. What would you say then. Mmm? Fifty, sixty. The same children. They gave the same set of tests to the same children five years later in the upper secondary school. What would you say then. Getting the sense of this aren't we.

Now, a lot of things have happened to these children in the intervening ten or twelve years, obviously. But one of the primary things that's happened to them is they've become educated by now. You know, they've been at school, where the dominant culture is that there is a right answer – it's at the back, don't look, you know, I'll tell you when – and where learning from anybody else might lead to you being accused of cheating. Is that right. Keep your arm around your work. That's the dominant ethos of our education system is learning of different skills and deviant behaviour is thought to be just that, you know, and it's rather punished.

Now, I'm not ... I don't mean to trivialise the problems of discipline and all the other things associated with education, but you know this is true. There's a powerfully normative influence at work in most of our education systems, and it's transacted through this hierarchy and the separation of disciplines, and then compounded by institutional ethos.

By the way, they gave the same test to twen... two hundred and ... two hundred thousand adults just as a control. One off: two hundred thousand twenty-five years olds and older. What ... how many would you say then.

Now, these are people you're hiring by the way, and who have graduated from our university sector very often. So, it's a big issue.

There are really three misconceptions about creative people, which I think all this points to, which I've tried to build into our model for change in the UK and further. These are three misconceptions, as I see them.

One is that only special people are creative; it's a rare thing. It's unusual, it's a gift, and if you have it, that's terrific, but many people don't. Isn't that true? That's the kind of ... secondly, that creativity is about special things, like the arts. And further, there's not much you can do about it. It's like an IQ thing, you're creative or you're not, and that's that. It's a natural endowment, and great if you have it and hard luck if you don't.

Well, all three views, in my view, are profoundly mistaken, and they're the result of how we've been educated. Firstly, everybody has profound creative capacities, absolutely everybody. And you ... it's especially easy to see this when you recognise that creativity is a function of intelligence, because our intelligence diverges in many different ways.

Secondly, you can be creative with anything, absolutely anything. Not just the arts. It's a real mistake. I think we make ... we have made a strategic mistake in the arts community to buy into phrases, like the creative arts. I just think we should stop it, because the arts have major creative components, but it's not all creative stuff. Often, it's just hard, rigid discipline, isn't it. They have other functions too. They're expressive, they're cognitive, they're all kinds of things the arts do in common with the sciences. We shouldn't buy into these aphorisms of created art, because it creates the impression, education, the arts is where you do the creative bit, whereas the hard work happens somewhere else. Particularly when you consider how people define creativity.

You know, we don't talk about the numerical maths department do we, or the empirical physics department, you know? Let's drop the creative arts, all right. (Indistinct) what they are, but the arts.

And by the way, you can be creative with anything. And thirdly, there's a lot you can do about it. You can create conditions under which people's creative capacities flourish. And the great conservatoires always did it, and we should learn from it. And the great schools always did it. And we should learn from them.

We should recognise that you can cultivate creativity, because we're so good at preventing it. You know, in a way, if we just stop stopping it, we'd see a remarkable growth. You can't teach it directly. I always think that education is a bit like horticulture, truthfully. You know, you can't ... nobody, no matter how good they are, can make plants grow. You don't do it. You're not there sitting cells together.

[Aside] Are you off now. Where are you going, by the way. Right, okay. Toilet, around the back. We'll wait.

[Laughter]

This ... I was at a conference a few months ago, and somebody's phone rang, and she ran out the room, with her bag, with I think two thousand people there. And the phone was in her coat that was on the seat.

[Laughter]

It was great. We waited for her to come back to say, it's for you.

So, I say, there's a huge amount that can be done to cultivate it, but not in the sense of our inoculating people with it. Education is really not a process of transmission. It's a process of enabling. The great educators create conditions under which people learn.

Alec Clegg, one of the great educators in Britain, once said, education is not about filling empty vessels, it's about lighting fires. And it is, isn't it? If that fire goes out, you're wasting your time, it doesn't matter how much kindling you throw onto it. And I think the horticulture one is a more powerful one because the great educators create the conditions under which they will grow themselves. You know, you don't sit there knitting cells together, you create conditions for it. And you can create conditions under which greater activities will flourish. But let me just quickly say why I think this is such a big deal. I'll explain about the ant in a minute.

The ... when I say there's a revolution happening, it seems to be in controvert. The world changing now, faster than most of us can grasp. I was born, as Jennifer mentioned, in 1950. My dad was born in 1914. Somebody asked the question recently, if you were to move somebody from 1900, in the west, broadly, let's say for now, to 1950, by some means, and simultaneously you move somebody from 1950 to the present day, which of these two people would ... explains the greater disorientation, culturally.

Got to be the second one, doesn't it, wouldn't you think. If you compare what happened culturally between 1950 and 2000, compared to what happened between 1900 and 1950 ... I mean, in 1900 there were large families. I'm one of seven children. My mother was one of seven children. There were nuclear families. The same was true in 1950. People didn't have motor cars in 1950, for the most part. Nobody went anywhere. The average person travelled about two miles a day, on the bus, went home again. Women stayed at home and wor... and did housework. Men went out to work, it was predominantly an industrial culture, predominantly manual work. I few people did office jobs. Nobody in my family did office jobs. Up until my generation, nobody did it. It's broadly the same, broadly.

The differences between 1950 and now are almost incomprehensible. If you think of the extraordinary changes that we're becoming to take for granted; we didn't have a telephone, much less a cell phone, much less the Internet.

Even this is true in 1970, by the way. There was an interesting distinction made, a while ago, by a guy called Mark Prensky, some of you will know, between digital natives – I thought I'd mention digital, Jennifer, as you trailed your (indistinct) about it - but between digital natives and digital immigrants. And his point is this, that if you're over thirty, as some of us now almost are, as I can see, just looking around; if you're over thirty, you were born before the digital revolution because pervasive, weren't you.

Your children, if you have them, if they're under twenty, were not. They were born in it. And the point, really, is they speak digital. They are natives to digital culture, we are immigrants. We're finding out, most of us have a phrasebook digital.

You know, we all feel groovy, you know, we've got our cell phones and our Apple Macs, you know, think about how socially in demand can I possibly be ... but really, it's a bit of word processing, isn't it. Excel, stuff like that, picking out, and it's really a fancy typewriter for most of us, isn't it, and a phone, but it has lights on it, so we're feeling good.

Kids, your kids, your grandkids if you have them, are on a different level. They live digital, all of them, don't they? My daughter is sixteen and when she's on the computer I can't believe it. You know, it's like me fumbling along with phrasebook digital, and she's fluent. Never been trained, but she's everywhere on the keyboard. You know, she's got windows open, she's ... when she's doing her

homework, she is downloading files, she's got five windows open, she's instant messaging people. She's got the cell phone going, she's sending images across the Internet. You know, she's downloading music. I mean, I don't know if she's doing any homework ...

[Laughter]

... but she's running an empire. You know, I ...

[Laughter]

I'm okay with it, you know, if it's paying for the school fees. You know, but it used to be a paper round in my day. But they speak digital. Now, what are their kids going to be doing, really. Because we think it's all smart now. But really, we haven't seen anything. We really haven't seen anything in terms of the exponential growth of digitisation. And the reason, I think, it will get even more profound is the development of things like nanotechnology. Do you know about nanotechnology? I won't dwell on it. Get online and check it out. Nanotechnology's fascinating.

It's the ... it's a new technology, or a new level of technology based at the molecular level. When I put my commission together in the UK, one of the people we had on it was a Nobel chemist, Sir Harry Kroto. Harry won the Nobel Prize for chemistry, for discovering the third form of carbon ...

[Tape is turned over]

... just outside Brighton, it was just lying around. And I (laughs) call this ... I actually called it the C60 molecule. It's a nanotube of graphite. Anyway, I got into this. I asked somebody what the unit of measure is in nanotechnology. Do you what it is? It's the nanometre. See, a moment's reflection would have got you there. A nanometre is one billionth of a meter. Try and picture, if you can, a billionth of a metre. Can you do it? No. Very small, take my word for it; tiny. I did ask somebody what a nanometre was – it's a billionth of metre. And he said, well it's ten to the minus nine metres. And I said terrific. Right. And that's what (indistinct) think it's called.

So I said, and what is that. And he said, well it's nought point eight zeros one of a metre. And I said great. Didn't help me, that's all I'm saying. So I said well help me, you know, what is it roughly. Give

me a clue. And what he said was terrific, I thought. He said a nanometre is about the distance that a man's beard grows in one second. That's amazing, isn't it?

[Laughter]

You haven't thought of that, had you. Think about that now. One second. If you've got a beard, or you're sitting near one in fact, or any form of problem facial hair, frankly, I mean ...

[Laughter]

... let's be entirely inclusive here, shall we. It must be doing something as we speak, mustn't it?

We know this, because it takes about twenty-four hours for the average beard to grow something less than a millimetre. And it doesn't do it suddenly, does it. Beards don't leap out your face, do they. Don't go off like a ratchet at eight o'clock in the morning. Beard's gone off again, I must set the clock earlier in the morning. It's completely doing my neck in. They don't. Beards seep out of your face at a very languid rate. All day long. Our language reflects this by the way. We do not say as fast as a beard, do we. No culture has embraced this conception. Except possibly Stratford-on-Avon. So ... where a glacier can give people a jump (indistinct). What's that? It's the Ice Age (laughs).

Anyway, there is something called a picometre, which is one thousandth of a nanometre. Not as small as we know. There's an attometre, which is a millionth of a nanometre, and then there is a femtometre, which is a billionth of a nanometre. These are real measurements in the field. A billionth of a billionth. So if your beard had a beard, you know, this is where we're going with nanotechnology.

Now this is going to lead to the next generation of information systems, which by the way may, in our lifetime, be based in DNA, and not in silicon. So people are talking plausibly now about computer-enhanced intelligence, of the merging of consciousness with technology. Not with a little groovy keyboard, but just thinking of it. In twenty years time, it's anticipated, you may be able to buy a PC that's as powerful as your brain.

At the moment, nothing comes near it. You have a hundred billion neurons, and no computer on earth even holds a candle to it. But by 2020, maybe it will. Serious predictions about this. A thousand US dollars, and the computer in front of you is as fast as you are.

I mean, how's that going to feel, you know, when you're about to send an email, you know, and the computer said, well, I don't know. Have you thought this through; I'm not clear you have, you know. And by 2050, maybe computers will be a thousand times smarter than we are, a thousand times more powerful. Well, that's my point really, as Jennifer says, kids being taken to school this year will be retiring probably around 2060. Well, what are they going to be doing with their time.

I was a student in the '70s and when I went to – the '70s changed our sense of time by the way – when I went to the library in the '70s, when I was doing my PhD, I would put in a full day at the library, actually it was a student day, obviously. Starts about two o'clock in the afternoon, you know, isn't it, because you have to rest in the morning, don't you, and let things percolate.

So I would go to the library for a couple of hours and probably get five references organised, you know, before the pub opened. And ... well now, you know, that was a decent day's work, but now you're online; you're the same, you're searching eight billion pages on the Internet on Google and it takes about fifteen seconds, doesn't it. Eight billion pages. And if it's more than fifteen seconds you're getting impatient, aren't you. You go, come on, you know, I haven't got all minute.

[Laughter]

I'm saying, what's over the horizon. We don't know, truthfully. This is the other thing. So that's an ant, and on its finger – if there's such a thing as a finger on an ant – is a microgear, a nanogear would be a thou... what, ten thousand times smaller than that. Very quickly, this is the other big thing which is changing everything; population. That's the population curve of the earth. In 1800 the population of the earth was one billion. In 1930 it was two billion. Took the whole of history to one billion. A hundred and thirty years to the second billion. In 1970 it was three billion, so the third billion took thirty ... forty years. In ... between 1970 and 2000 it doubled. Six billion. But when Sergeant Pepper came out there were just three billion of us grooving to it. And then there were six billion on the night of the millennium and it's going to get to probably about nine billion as anticipated.

This is interesting too. No, it isn't interesting. I'll tell you what's interesting. What's interesting is there's a lot of big shift to the cities. In 1800, four per cent of people lived in cities. Now it's sixty per cent of people on earth live in cities. It's a massive urbanisation. And the birth rate is shifting around the planet. The real growth is not in the west but it's in the emerging countries. The birth rate is falling in most developed countries; less than two point one. Two point one is the sustainable level for population renewal; two point one children per mother. And in most countries it's now falling below that.

By 2050 in the west there will be more old people than young people, more people over sixty-five than under sixty-five for the first time in history. Big change. So there's an ageing population as well.

Now, my point is just coming right to this. The challenge is that our education systems in every case almost were designed at a different time to do something else. There wasn't a country on earth that had the formal education system before the eighteenth-nineteenth century. That's just like a formal education system paid for out of taxation and compulsory for everybody. Before that it was optional and it was mostly private and fee paying.

The reason we have formal education systems in the first place, it was industrialism; the growth of industrial economy, which was largely based in manual labour with a small clerical class. And now we're facing a revolution where the majority of work is being carried out intellectually. More and more people work with their heads than their bodies – as you do – worldwide, and more and more people are having to get qualified in order to be able to do that kind of work.

In the next thirty years, the combination of the growth of the knowledge economy and population combine to mean that more people will be educated throughout the world in the next thirty years than since the beginning of history in total. (Indistinct) all up until now there would be more of them qualifying in the next thirty years. And one of the results of it is that the value of academic qualifications is plummeting.

In the '60s, if you had a degree you had a job and that was it. I left in 1972, I left college with a degree and I never doubted I would get a job. I just didn't want one. I thought it was a bourgeois trap, you know, and ...

[Laughter]

... frankly, and I signed on immediately for social security as a way of snuffing the system. Now, I (laughs) ... I thought, that will show them, I'll bring them down single-handedly if necessary. No, I didn't ... I wanted to find myself. I'd spent all these years in education and I thought who am I, who might I be. I wanted to discover who I am. So I set out on a journey. I decided to go to India where I thought I might be. You know, (laughs). Fair chance, I thought (laughs) I'll check out India, I could be hanging around there for all I know. I didn't get to India, I got to Houston. And then I got to Camden Town where there are a lot of Indian restaurants, by the way, so I ...

[Laughter]

And the Rising Sun pub, where I could focused my activities for the next four years (laughs). Focused my inquiries there.

But now having a degree is no guarantee you'll get a job. On the contrary, where you needed a degree you now need an MA for that job and where you needed an MA, you now need a PhD for that job. It's a process in inflation. It's not because qualifications are getting easier, it's that they're becoming more common. It's a fault line through the whole current system and it's why I say we have to rethink.

So let me tell you what I think the answer is, in part. I think that the answer for us is in a re-conception of our capacities. There are three key terms here, as I see it, if we want to start to build a new settlement. The first is imagination. I ... it's not that I believe this, I just think it's become self-evident to us all, that the distinguishing feature of human intelligence, what makes us human, is the extent of our powers of our imagination. I mean by this our natural capacity, which you take for granted, to bring into consciousness representations of events, circumstances, phenomena which are not present to you.

You know, if I ask you to think of your office, you can do that, without just having to go there and see it. You bring it into consciousness. And we don't know whether animals have this capacity, or what extent they have it to, but it's clear that none of them has it to our extent, because on the basis of imagination comes everything. The capacity for symbolic representation, for language, for art, for a past, for a future, for a sense of identity, a sense of purpose and meaning ... it's all invested in this capacity to suppose and to bring ... because as soon as you can bring things to mind that are present, you can

bring things to mind that have never been present, and never been before you; possibilities which have never yet occurred. And without that, we'd all still, really, be sitting in a different cultural settlement, entirely. All human culture has been spurred by the growth of human imagination.

But it's not the same thing as creativity, that's my point. It's the foundation stone of it. You could lie in bed and be imaginative all day long, but you wouldn't consider that to be, in itself, a creative act. To be creative, you have to do something. Creativity is an idea, it attaches itself to public outcomes, you know, to have done something, to be creative.

So I think of creativity this way. Creativity, I suppose if you want to shorthand it, is applied imagination, if you want to put it that way. It's the process of having original ideas that are of value. You'd always ask that of a creative idea, is it new? What's it worth. Now, the question of value judgment is very interesting because it implies a cultural perspective on it. And it's of interest, I think, to all of us, that often the most original thinking ... thinkers were the least valued in their own times. They came up with extraordinary things, but nobody could see the purpose of it quite then, often because they ran ahead of the cultural curve. Isn't that the case, in almost every field. Because the idea was original, but often we couldn't see ... sometimes, by the way, the idea was valueless in any culture. I don't mean to say that novelty means creativity, but it's those two things combined that bring together.

Now, my point is you can be creative at anything, whatever, that involves your intelligence. Anything. And interestingly, the process is often very similar. Harry Kroto, who is on our committee, was also, as well as winning the Nobel Prize for Chemistry, is also a professional designer. I asked him one day what the difference is in the creative process in science and art, between the laboratory and the studio. He said there is no difference that I am aware of. It's the same process, of speculation, of applying knowledge, of feeling out the boundaries of what's possible, and testing against what we know already.

We caricature the arts and sciences I think in a tragic way. We think that science is all about truth, and the arts are all about possibility. It's wrong in both cases, I think. And innovation, I would say, is this: the process of implementing new ideas. I suppose if you'd have to shorthand it, I'd say that creativity is part of the imagination, and innovation is applied creativity. It's putting these ideas into some form of practice.

Well, the ... I was saying earlier, I think we ... the problem is that we have disconnected our conception of creativity from our conception of intelligence, and I think it's because education, as it grew up as a state facility, was pretty much shaped in the interest of the universities. You think of it. Education pretty much from kindergarten these days is focused on getting people into college.

In LA, there was a report recently written called, in all good faith, it's called College Begins in Kindergarten. Well, you know the result of that is it filters out a lot of stuff which is proper to young children's development and may not be so later on. But we've become enmeshed in a culture of academicism. I don't speak in criticism of academic work.

Academic work is powerfully important, but it's rooted in capacities for deductive reasoning; a certain type of critical analysis. It's powerfully important. That's not my problem. My problem ... ours is ... I think our problem should be that we've come to conflate it with intelligence, overall, because it's become prioritised.

You know MENSA, the organisation, very good organisation, I have no doubt. The problem I have with MENSA is not what the work it does, or the people who join it, it's the branding. I'm a bit worried about this. MENSA is suggested as the organisation of the most intelligent people on earth. Well, really. Really? You know, MENSA is based essentially on a culture of IQ. You read all the stuff, that's how it grew up. I mean, some of it's broadening out now, but that's where it was. But that's the public conception, you know, you've got an IQ like a planet, you know, brain like a planet, you've got an IQ of a hundred and fifty, great.

And to get into MENSA, you take an IQ test, largely, and if you score over a certain point, you get into Mensa and go to their Christmas parties, where you sit with other members doing IQ tests for recreational purposes. You know, but ...

[Laughter]

... wearing paper hats. It's a great (indistinct). But I think, if you really wanted a system to test who the most intelligent people on earth were, the top five per cent, the most intelligent people on earth, wouldn't you have some other tests as well, you know, like, could you choreograph a dance, could you perform one. You know, could you write poetry that speak to people's inner spirituality. Could you paint

pictures that would move people. You know, could you run a successful business. You know, could you compose and conduct a successful series of scientific experiments. Do you have any friends, you know ...

[Laughter]

You know, stuff like this. I'm simply saying, that we have these powerful iconic brands before us which tell us that intelligence is this capacity. And I think all the evidence is, it is not. It's a multifaceted, multifarious set of capacities, some of which have been valued and some of which have been denigrated. And I think we're going to have to start rebalancing our curriculum to make sense of this.

We know three things about intelligence, I think. One is, that intelligence is diverse; the second is it's dynamic; and the third it's different, distinct. If you're interested, and I think we all should be, in promoting greater creativity in our institutions, in our cultural organisations, in our schools, in our businesses, I think we should see it as a three level process. Not sequential, but multilayered simultaneously.

The first is ... you will be astonished by the elegance of (indistinct). It's personal. This time it's personal. I think that we should recognise the extraordinary capacities that we are endowed with, and that our sense of reformulation of institutions should begin by a different appraisal of personal capacity. We should be focused on the development of individual capacity in a different way.

Secondly, we should recognise that, actually, most creative work – not all, but the vast majority – is collaborative in some way. A lot of creative work is like intersections in interdisciplinarity (ph.sp.); people running off each other's ideas and coming up with new stuff. It's true in research laboratories, it's true in theatre companies, it's true in writers' collectives. None of us lives in a social or cultural vacuum. Artists are not on parole from the culture they live in. You know, our ideas are infused, and promoted and stimulated by the ideas of other people. It was always thus in every field. Education tends to still those dynamics.

And thirdly, it's about culture. What I mean by culture, is the values and motor behaviour that characterise communities. Institutions have cultures, and some are powerfully creative and some are not, because there's something in the genetic code of the place that encourages it or discourages it.

I just want to say a few words about these before we do the coffee thing. This is my own graphic, by the way. I designed this. Come on, really I ...

[Laughter]

And (laughs) did the whole PowerPoint thing. You know, we're talking multi-talented. Did you see that?

[Laughter]

Just make that for you. There we go. In case you missed it the first time. I think, if you're trying to promote creativity, you have corresponding roles. Whether you're a teacher or a cultural policy maker, or a political leader, or you ... in your own capacity of parent. The first is to develop individual creatibilities (ph.sp.) and I want to just say these things. We know three things about intelligence, as I was saying. It's diverse, it's dynamic and it's distinct. We ... in contradiction to the dominant IQ culture. It's diverse in a sense we think about the world in all the ways in which we experience it.

We think visually. Painters are having visual ideas; architects are having visual and spatial conceptions. Not exclusively. I'll come onto this. But they're thinking visually. Musicians are thinking musically. There's a great quote, and I think it's was from Mahler but I don't know, and you may not know either, so I'm going to say it anyway. Mahler was playing a new piece, and a student came in as he was finishing off this new composition, and listened to the end of it, and the student said at the end, he said, maestro, that was marvellous, and he said, what was it about, the new piece. And the composer said, oh yes, it's about this and he played it again.

If there had been some other way of expressing, there would have been no need for the music. It was a musical conception. So, we think in all the ways that we experience the world.

Howard Gardner talks very persuasively about seven forms of intelligence. I demur a little on this. I don't think there were seven forms personally. I think it's another way of thinking about it, it's a good way of thinking about it, but I think we should stop short of thinking the brain is in seven sections. You know, in Britain we have a national curriculum. We've got core subjects and foundation subjects, there are ten: three core, seven foundations. It's a nonsense idea dreamed up by Margaret Thatcher, but it

was a way of institutionalising the hierarchy, you know, but I was saying at the time in opposition to this, if you were to examine a brain, a human brain, you would not find it in ten compartments, you know, with three big ones and seven smaller ones, and a smaller dance nodule underneath, you know ...

[Laughter]

... which had shrivelled away in most cases, most adult cases, you know. It's not the case.

The brain ... there aren't seven forms of intelligence, as far as I can tell intelligence is multifaceted. There is a theory which helps to explain it by saying there are seven, but you know, it's multifaceted.

The interesting thing as well, is that the brain configures differently in different activities; if you're speaking a second language, different brain centres are used compared to using a first language, interestingly.

The second thing is, so the first thing I'm saying is, that our education system should address the multiplicity of our intellectual capacities.

Secondly, intelligence is dynamic. If you look at any of this MRI stuff, you know, magnetic resonance imaging, you'll see the brain light up in all kinds of interesting configurations during the same tasks. It is isn't like if you're speaking this bit comes on or the visual cortex lights up if you're looking at a photograph and everything else is dormant. It's intensely interactive.

Music has a location, has a focus in the right frontal lobe, but that's not the only bit of your brain that's used when you're making music. I mean, if you were to remove the right frontal lobe, it wouldn't sing to you, really; it has to be connected to everything, it's dynamic.

There's a shaft of nerves that joins the two halves of the brain called the corpus callosum and it's this which largely is responsible for the trafficking between the two hemispheres of the brain. In women - interestingly, you may be interested to know this, the research indicates - typically the female brain physically is smaller than the male brain, typically. It hasn't got fewer neurons or less capacity, it's just because women physically ... women tend to be physically smaller, not in every case but typically.

But the really interesting thing is the corpus callosum, this bit that joins the two halves of the brain together, is typically thicker in women. And it's thought that this is one of the correlatives with women's typical capacity for multitasking. Because it is generally true, isn't it, not universally, but often the case that women are better at multitasking. In my experience, apart from the research, and there's a bank of it, I just know it's true in my own life that women are better at multitasking. I know women at home, you know, when Terry, my wife, is cooking, it's not all she's doing. You know, she's on the phone, she's dealing with the kids, you know, she's painting the ceiling, you know, she's doing open heart surgery ...

[Laughter]

... neutering the cat. You know, you know, all while the meal is burning, you know (laughs) ...

[Laughter]

... it's a remarkable skill. But if I'm cooking, you know, the door's shut, the phone's on the hook, the kids are out, you know, there are no dis... as soon as Terry comes in, I start to lose it, I say, Terry, please, you know, I'm trying to fry an egg in here. You know ...

[Laughter]

You've no idea what's involved.

[Laughter]

Seriously. You know, if we're watching the television, if the phone rings – we don't watch much tellie – but when she's chatting on the phone, watching the program. And I'm getting jumpy. I'm thinking, are we watching the program, what. Women use more words in a day. You must have spotted this (laughs) ...

[Laughter]

... we don't need Harvard to explain this to us (laughs). But you do. You get through over a hundred thousand words a day. Through sheer repetition often (laughs) ...

[Laughter]

... not. No, but men use a lot fewer words, twenty thousand often typically in a day or in Shane Warne's case, you know ...

[Laughter]

... four (laughs). You know, so ... no, so I believe.

No, but women use more words and actually their language centres are more diffuse. Often it's the case. And there's often a different mode. I mean, there's actually a very interesting book called ... there's a lot of research about looking at gender differences. We can feel more comfortable discussing this now because they're apparent. You know, without making value judgments about them.

But it's often the case, for example, it helped to explain a lot of things to me that in the evening, typically, a woman wants to talk more in the evening than a typical man does. And guys tend to come in and they're kind of done, you know, they've used the words up, thank you, I'm fine.

[Laughter]

Isn't that right. Oh no, give me a drink, I'm fine. You know, and if we must talk, men tend to go into executive mode, you know, discussing some issue at work. You know, guys tend to try and want to solve it. You know, and say, okay, here's what we do. Just to end the conversation really so we can go and get on with something else. Whereas typically women don't want ... they're not into problem solving mode, they're in discursive mode, they just want to talk about it or they get nothing out of it.

There's some ... anyway, there's some interesting, typical, not exclusive, just typical differences. But this dynamism is important. Mathematicians think often visually. Read about mathematicians and how they think. Musicians think mathematically. Dancers think visually and spatially.

If you go to watch a contemporary dance performance it's a kinaesthetic and visual experience for the dances; it's a visual art for you, isn't it. It's not one thing or the other, it's an intense visual form and kinaesthetic and all those things. It's intensely dynamic as a process.

I used to supervise PhDs in the humanities in ... when I was a professor at Warwick University and we introduced a word length for PhDs which was just as well really, because after a point people have to be prevented from going on. You know, the word length was a hundred thousand words, sorry, eighty thousand words. And I've got a graphic example of this. I was on an interview panel at Warwick and the department concerned had – I was an external examiner on the panel – and the department concerned had figured out that being interviewed could be stressful. Have you come across this?

[Laughter]

There's a lot of research, but it can be stressful. And so to make it less stressful for the candidates, for a lecturer's job, they decided to arrange a lunch between the candidates and the panel, so we could all relax. You know how relaxing that can be, you know, when you're ... you and the other candidates are standing there with the panel, chilling out in a Zen-like space with them, you know.

And in order to make sure they were completely at their ease, they put together a buffet lunch. So we had these white plates, you know, a little white plastic plate, which are now standard in education, aren't they, and warm chardonnay, cheap. And in order to make sure they were completely at their ease, they had provided a finger buffet, which was composed entirely of things that were covered in puff pastry.

Really, and shoe pastry. You know, sausage rolls, you know, vol-a-vents, , samosas, you know, the messiest foods on earth. You know, these are things you couldn't eat in your own home without being self-conscious, and here we are being interviewed. So these people are wandering around, with these plates and things.

Anyway, there's one candidate there, and I went to ... I knew I could see he was a candidate, because he was covered in crumbs, you know, he ... it's like ... I went over to him, and I said ... I'd realised ... I'd read his CV, and I knew he'd just handed his PhD in, and I think it was at Nottingham, and you know, Nottingham, apparently they call it Derby, about twenty thousand people there, I think.

But I asked him about his PhD, and he was telling me, and I said, by the way, did they have a word length, at Nottingham, and (indistinct) said no, really, I mean like, as if it was a preposterous idea. I said, how long are they. He said, well, they're as long as they need to be, really. I said, oh really. I said, and how long did yours need to be? And this is honestly true, he said it was three hundred and sixty thousand words.

Well, that's the old testament, isn't it, really? Isn't it? I fell to my knees. You know, I said, master you have returned, I said, and in such humble guise, you know, all covered in breadcrumbs.

[Laughter]

You'd have been pleased, though; my face was a mask of passiveness, you know, because we do a training course in higher education now on control of the facial muscles, when presented by preposterous ideas. And I did crush my sausage roll, I remember that, because I didn't finish the whole course, I couldn't do the last week.

But, you know, it's ridiculous, isn't it. Oh, that's right. And I said what's it about, trying to control myself; and I said, what's it about. And this is the God's truth, he said, it's called, Further Education in Derby ...

[Laughter]

... subtitled, Some Issues. So, this wasn't even a comprehensive study. This was like a kind of promissory note, you know, for a fuller work yet to be completed. Well, it's ludicrous isn't it, really.

I mean, actually we went in ... we went to the interview, and I remember we asked him three questions in the interview. The first question was ... the panel ... the interview judge said, the chairman, why have you applied for the job. Innocent enough question. And it took him twenty minutes to respond to it. And I realised he had some form of verbal dysfunction, because he spoke in a continuous utterance. You know, it was like one long German sentence, you know, with compound verbs and clauses, right the way through the whole thing, and he didn't pause for a breath.

Because you know, when you're listening to people speak, you're waiting for some implied punctuation, where you go, actually, you jump in. He didn't do that. He'd done it ... he'd developed that thing that people who play that clarinet can do, you know, of breathing out while breathing in, so it's like a continuous cycle, there's no natural pause there at all.

So we sat there, a bit stunned. It got to the end of this thing, and then ... I actually asked him two questions. We ... at the end of this, we asked him, our second, it turned out to be our final question, and one which had become increasingly hypothetical, which was, what would you do if we appointed you.

[Laughter]

No question of that happening, by then. Anyway, I said to the guy chairing the panel afterwards, I said, what did you think of him. And I love this, he's paused, he says, I think he chewed more than he bit off.

[Laughter]

So, it's dynamic. That's a brain, by the way. And it's distinct, this is my point, that your intelligence is different from everybody else's intelligence on Earth. You have a hundred billion neurons, a unique biography, a unique set of experiences, capacities, wishes, longings, and values. There has been no person like you in history, and there won't be again. And we cannot afford to squander the resource. You're unique. Your brain, incidentally, I'm told – your personal brain – is as different from every else's brain, it's as different from my brain as your face is different from my face, or as a alike as mine.

Similar, but unique to you. So the real question I think, is this. It's not how creative are you, it's ... or how intelligent, it's how are you intelligent and how you are creative. What are your capacities.

And I just want to say, there are ... these are two of the things I mentioned. It's about groups and it's about culture. Most creative thinking is driven by group activities, and the reason is this: good groups model the human mind. Groups that achieve a lot are diverse, they're dynamic and they're distinct. You bring together people in great groups with different conceptions, different points of view, different takes, different value systems, and if they are facilitated in the right, dynamic way, they fire each other's imaginations and they feed each other's creative impulses. The great groups all do that, and

they're distinct to the tasks that have been formed. All the great groups are distinctive as individuals. And in institutions, if you want to drive creativity, let's drive it through great collaborations and interdisciplinarity (ph.sp.). Let's model the dynamics of disciplines in the way we compose our institutions.

And my third point was about culture. Some organisations do it and some don't. These are the things that stop creativity. Strong hierarchies, where the power is pushed from the top to the bottom, instead of rising throughout the system and bubbling up from beneath. And you know it. If somebody keeps saying your ideas, eventually you get the point. And it happens in political systems too. If you have senior figures in politics who are pushing hard down, eventually it starts to disperse the energy.

Strong borders do it, strong silos between ... within and between institutions still the creative impulse, but great institutions are dynamic and permeable. And thirdly, the element of risk taking is powerfully important.

When we talk about accountability, let's make people accountable, but let's not kill the idea that they're trying to be accountable for. Let's not confuse standard with standardise. Now, we've tried in All Our Futures to set this out as a series of prescriptions for education; I just want to give you two very quick fine examples. There's a great organisation called Pixar. Pixar is probably the leading animation studio in America at the moment, and they keep winning Academy Awards left, right and centre.

One of the features of Pixar Univers... of Pixar, is the Pixar University. Every day throughout the Pixar studios there's a program of workshops, of movies, of documentaries, of debates of sporting events, just all day long. Like a university. Every member of the Pixar staff is encouraged and entitled contractually to spend four hours a week at the Pixar University. Whatever else they're doing, just go and do something. And it doesn't have to be any direct connection with their work; in fact, on the contrary. The idea behind it is to fuel their imaginations. If you want people to be creative, feed their imaginations. That's the groundswell of the whole process. Feed them, encourage them, stimulate them, and then give them processes to apply their imaginations to something.

And the second thing is, it mixes people up across the whole organisation. John Lasseter, who runs Pixar, might be sitting with people from the McCarthle (ph.sp.) working on a project for a few hours a week. So, there's a constant cultural interplay.

Cultures make a huge difference. Redesign the culture, you'll get a different expectation, a different set of results. And the last is a very quick final example. I'm doing a new book at the moment called Epiphany. Epiphany is a book about how people discovered their talent. How they got to be doing what they did, and it's some... it ... people from all kinds of walks of life. I met a guy in Irvine in California who's a physicist, who described himself to me as a native speaker of algebra. Isn't that great. I couldn't bear algebra at school. I didn't know what it was. But he said, when he came across algebra, he just looked at it intuitively, like some people love French, just loved it, and he became a physicist as a result. He said, I now speak most ... spend most days speaking algebra. He said English is really my second language now and algebra. It's irritating to his family, but there it is. You know, but ...

[Laughter]

... he's ... he is in his element. And that's my point, really, that to achieve your best, you need to be in your element. Because if you're being creative, you have to do something, and to do it, you have to be working in a medium. And very often, the people who achieve most are the ones who love the process they're in. They just love the medium. They love the paint, they love the numbers, they love the sound, they love the instrument. It's not music, it's the violin. Those kids last night who were playing at a reception on the string quartet were just wonderful. You could feel that they were in their element doing the thing they wanted. For some people it's countenanced; just finding what it is.

So, it's about how people discover their talent. And it was sponsored by ... it was triggered by a conversation I had with a wonderful woman, who some people here know, but most people have never heard of, called Gillian Lynne. Gillian Lynne is a choreographer, and I had lunch with her one day and asked her how she got to be one. Gillian is now seventy-something, I guess. Anyway, she said, when she was at school in the '30s she was a really bad student, you know, elementary school. She said, she never concentrated, she couldn't pay attention, her mind was constantly wandering. Her handwriting was bad and her assignments were always late. And she said the school became so concerned about this that they wrote to her parents, and said we think Gillian has a learning disorder.

Now, bear in mind, this is the 1930s. it's a bit of a stigma now, but then ... I think nowadays by the way they'd say she had attention deficit disorder. Wouldn't they. But this was the 1930s and attention deficit disorder hadn't been invented at that time. It wasn't an available condition, you know, people (laughs)

weren't aware they could have that. And so they had to make do without it (laughs). I think they thought it was Saint Vitus' dance which was the nearest available condition to it.

But she said she remembers going to see a doctor with a ... a psychologist with her mother and said she was probably ten, and she said, my mother, you know, put her best dress on and her best shoes and said, I remember going into this man's office. And it was oak-panelled room, leather-bound books everywhere, really intimidating, she said. And he was there behind his big desk, half-moon glasses on. He came in, welcomed us and he led her in and sat her down on the leather sofa at the end of the room. And she said she was so young her feet weren't even touching the floor. And she said I sat on my hands so I wouldn't fidget.

And for about twenty minutes he talked to her mother about the problems at school, and said it seemed endless. You know, they described all the issues and all the problems that she was having and that she seemed to be causing. And all the time, she said, he was staring at me. And at the end of this he stood up, she said, and he came and sat next to me for a few minutes and said, look Gillian, I've been listening to your mother now telling me about all these problems at school. I really now need to speak to her privately. So we're going outside for a few minutes and we're going to leave you here, but don't worry, we'll be back. And she said, okay. So she said, they went and left her on her own.

But as they went out, he turned a radio on that was sitting on his desk. And she said, they got into the corridor, she learnt later, and he turned to her mother and said, just stand here for a moment and watch her. Just watch what she does. And she said, of course, the minute they were out of the room she was on her feet, moving to the music, all around the room. And she said, they watched her for a few minutes and apparently turned to her mother and he said, you know, Mrs Lynne, Gillian isn't sick, she's a dancer.

[Laughter]

Take her to a dance school. I said, what happened, Gillian. She said, I can't tell you, it was wonderful. I walked into this room and I found all these people like me, people who couldn't sit still, people who had to move to think. And I said, what did you do. She said, we did everything; we did ballet, we did tap, we did modern, we did jazz, we did contemporary. She said, it was a complete liberation. I realised who I was. She was encouraged to join The Royal Ballet school. She eventually joined The Royal Ballet at

Sadler's Wells. She became a soloist. When her ballet career came to a natural conclusion she formed her own dance company, Gillian Lynne Company. She met Andrew Lloyd Webber along the way. She's been responsible for some of the most successful musical theatre in history including Cats, Phantom of the Opera. She's given pleasure to millions and she is presumably a very wealthy lady. Somebody else might have put her on medication and told her to calm down.

Now, I'm not saying there's no such thing as attention deficit disorder but what I am saying is there are millions of Gillians out there, all of us in a way are Gillians. You know, we all have capacities, we all have possibilities and it's the job of education to find them and to bring them on. And I think for historical reasons we've been cultivated into a system of education which has had other purposes and for the future we need to repurpose it.

We will not meet the challenge of the future just by doing better what we did in the past. We have to do something different. We have an economic model and an intellectual model on which our education system is built. We have a new economic and cultural future and we need a new intellectual model to make it possible; and new institutional processes to fulfil it.

We can't, any of us, really, predict the future. What we know is our children will live in it and we won't, eventually. And their children will live in a future that they can't anticipate. We don't know what it will be like. We can see a little bit but we can't see that far. But we ... it's our job to prepare them for it somehow and to also engage them in the present. And I think to do that it's vital that we build their creative confidence and their capacities and to see it's not just whatever you think, it's a disciplined process where hypothesis merges with discipline, control and cultural knowledge.

But we must not stop children saying to us, they will in a minute, when they show us a picture of God. We mustn't say they're wrong. We've got to build their capacity eventually to be right, because we can't see the future, but I think if we raise their eyes and their hopes and their expectations and give them the skill base, maybe they'll see it. And they'll create it fresh, and I think it's our job to help them.

Thank you.

[Applause]

[Tape is turned over]

BOTT:

Actually ... oh, I'll ask you one then. I'd like you to expand the comments you were making about the arts in California.

ROBINSON:

But I'm not going to. Okay. (Laughs). Yeah, very briefly. In the '80s, late-'70s, I was ... I was talking to Andy, where's Andy; there was a law passed in California called proposition thirteen which limited the amount of money that could be raised through property taxes in California. It capped taxes at the price of purchase, whereas previously property taxes were index linked to the growth of the value of the profit. The taxpayers loved it, but it removed billions of dollars from the California economy.

And one impact was on education, they had to cut in education to balance the books. So what do they cut; arts programs among them.

So we now have a situation in California where public schools have empty theatres, and locked up art rooms. I went to one ... arts programs are almost non-existent across whole areas of California. They have something called ... I found it remarkable. They have something called Art on a Cart. One of the agencies is trying to do ... and lots of people trying to do something about it, you would if you were there, but one of them is a visual arts agency, and they have a peripatetic teacher who goes round with a dinner trolley, school to school, loaded up with crayons and art materials, and she pushes it from classroom to classroom, because there's no art room or materials in the school. And schools can buy the service in, it's called Art on a Cart. So, it's a desperate situation, really, and a number of us are working hard to try and put it right.

I'm involved with the one that's called the Education Commission of the States. You should check it out online, it's interesting, ecs.org. But this is an organisation which aims to support and promote education developments at the state level. Because like in Australia, the states are powerful, and the federal government is something the states try to keep at arm's length.

Anyway, the chairman of the ECS, this is a man called Mike Huckabee, he's this year's chairman, he's the governor of Arkansas, the Conservative Republican governor of Arkansas. And each year, the

chairman gets to pick a theme, and he has picked arts education as his theme. Isn't that great. And the reason is, that he said the arts saved him at school. He did drama, and he did music, and he felt it transformatively (ph.sp.).

He plays guitar, he has a band, a rock band, called Capital Offense.

[Laughter]

It's great, a group of politicians. So I'm working with them, I'm one of the commissioners for the ECS trying to promote arts education across the country. So, I'm saying, it's a similar thing. People have said it's a good thing, but then it doesn't quite happen, but in California, it was a very clear example of how a fiscal crisis issued in cuts in arts programs, and we're doing what we can to figure that out.

BOTT:

Anybody else like to ask a question?

Sorry, just wait for the mic. Can you say who you are?

RICK GODDARD – IS THEATRE:

Sure. Rick Goddard from Is Theatre. What are some of the strategies and processes you use to convince ... because obviously the people who are in power at the moment, and who will be going into power are the two per cent of people who are removed from their own creativity and don't think of themselves as creative, so what are the ... and don't value that creativity, so what are some of the kind of processes that you use to persuade them, other than language, and lobbying.

ROBINSON:

Okay. Threats, of course. There's always threats and intimidation. And no, seriously, photographs I'm prepared to put on the Internet, by the way. I'll tell you what everyone's in, in the UK context. When Blair was elected, '97, he made a series of speeches about creativity. And then, as I say, he put in place a series of policies which I think, acting in good faith - that's my assumption - conspired to the contrary.

You know, it ... and it struck me, having spent most of my life around these issues that this was an opportunity we couldn't let pass. You know, that is was clear that the Labour administration would be in for at least ten years, and I hadn't spent my life trying to promote these issues, just to see it go down a hole, you know, because it hadn't been figured out properly.

And I felt that they were on the right agenda, that creativity is vitally important, and for me it's a kind of portal into a bigger conception of education. And ... but I also ... it just gave me real pause for thought, you know, because it seemed to me that something interesting is happening, in most of our cultures, where people can say the arts are important, and then see them wither. And I don't honestly believe it's intentional. I don't mean it's true of all politicians, but I don't think in general terms, politicians sit around cabinet tables, trying to figure out how to destroy the arts in schools. I don't think there's anything ... we're going to have to end this now, you know, this has become a national threat. You know, and I don't think ... the problem is, they don't think about it. And the arts become part of the collateral damage of the things they are interested in. There's a ... one of the things I mention in the book is something called the septic focus. I always like this idea. The septic focus is an idea that holistic doctors use, and holistic practitioners. Conventional medicine, you must know this, is focused on symptoms. So, if you've got a bad back, you'll be sent to a back doctor. In California, by the way, this is rampant. You know. They have hand doctors in California. And finger doctors. Probably left finger doctors, for all I know, and fingertip specialists. But you know, they've got specialism down to a complete fine art.

And the story I start the book off with is a real story. A friend of mine is an actor, Dave Atkins, who was ... some years ago now, but he was a big guy. He weighed probably twenty-four stone or something at the time, largely through drink. And he got these ... all these parts, the heavy in movies and things. Great guy. Great actor.

But I saw him one day in the pub. And he said he'd been to see his doctor. He was a bit worried because his doctor ... Dave had back pains. So his doctor sent him along to see a specialist, because he thought that he had a kidney problem. So he sent him to see a kidney specialist, and the kidney specialist examined him, and he said yeah, you know, you've put a big strain on your kidneys. So you're at risk of renal failure. And Dave looked, you know, suitably concerned, and he said, what could be causing it, doctor. And the doctor said, well, I don't know. It's a mystery. Do you drink, you know, and ... shot in the dark. And Dave said yeah. Yeah, I drink, you know, socially. He just socialised a lot,

I think that was it really, I mean he ... like twelve pints a day. You know. Generally. So the doc... and this is the point of the story; the doctor said well, you know, if you keep drinking like this, you're going to destroy your kidneys. You have renal collapse.

He said, so w... give it to me straight doc, you know, what can I do. And he said, you're going to have to stop drinking. And Dave said well, you know, I can't really, you know. I'm an actor. You know, it's a kind of occupational requirement. And he said, well, why don't you take up spirits.

And Dave said, but I thought spirits would give me cirrhosis of the liver. And he said to him, but you haven't come to see me about your liver. He said I'm a kidney specialist, right. The liver is four inches away and down the corridor. You know, if you want to ... you know, go and ... my colleague will do livers for you. But ... I mean his concern was that if he died, it wasn't his kidneys that did him in, you know. So ... no, it's called the septic focus in medicine, which is a tendency take a symptom out of context.

Because the truth is, Dave's problem was his lifestyle. It just happened to turn up in his kidneys. You know. And I'm saying that in schools, we have the same thing in terms of educational policy. There's a septic focus in policies, they think we've got to do something about literacy levels, let's do literacy.

You know. Let's just do this, and drop everything else. And you know, what you want to say to them is no, don't just do literacy, do other things that motivate, and drive people, and make them want to write. There are other things that engage them in writing, and which give them a joy in reading. Do arts stuff with them as well, you know.

So I think it's because they're trained that way, and the other big problem with politicians is short termism (ph.sp.). They're all elected for a few years, and they want to do something they can do in their term of office. This is too long term for most of them. They don't want it to go wrong on their watch.

So what I did in the UK context, and in Northern Ireland, in the peace process, was trying to make it clear that this was in their interest. There's no point just trying to train politicians in the arts or do something that they're not interested in, you know. And I just think strategically, if we've learnt anything in the past thirty years, if we're not to have the same conversations thirty years from now, you've got to

engage policy makers on the agenda they're worried about. Not on some other agenda which they're not going to get round to.

So I took the opportunity with the creativity issues in Britain to engage them on that, and I also saw a bigger opportunity, which was to get a synergy there, and to get a group together, which wasn't just about the arts. Because I really think this isn't just about the arts. I think this is about systemic change. And the arts are a metaphor for a bigger way of thinking about education.

And I therefore wanted to make common cause with the sciences, the business communities, because all my career, I've realised that people in science talk about the same stuff. And that people in communities talk about the same sort of stuff. The problem is we don't talk to each other about.

So I just put it ... I asked a different question, and we got a different answer. And I think we should do that. If you get ... keep getting the same answer, ask a different question. And I felt that if I'd gone to Tony Blair at the time he said I'm really worried about the arts, you should have an arts commission, I'm sure he just said speak to the arts minister.

What we actually said was, you've got a major economic challenge now in Britain. Education's going to help it and creativities the way forward, and we can help you with that. And that brought the arts around the table, with industrialists, with cultural entrepreneurs, with artists, with scientists, not to say the font of education is only economic, but that among the things education has to do is an economic set of realities that we can help them figure out.

And I always feel this with politicians; they respond better if you go to them with solutions rather than problems. They've got problems, you know. Take them a solution. And if necessary, then vote them out if they don't get it.

BOTT:

Well Ken, thank you so much for getting the conference off to an inspirational start. And ladies and gentlemen, please join me in thanking Sir Ken Robinson.

[Applause]

END OF SEGMENT