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Children's Universities: Science Communication, Role-playing Exercise or First Step of Being Tamed?

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I would like to begin my presentation with a short personal reflection and two anecdotes. A disclaimer: "Children and science" is actually not a core field of my expertise and there are many people in this room who hold a much more fine-grained knowledge and richer experiences on this issue than I do. Yet over the last 15 years I have been carrying out research on the way how citizens from different backgrounds perceive, position themselves towards and deal with scientific and technological developments and this in a variety of contexts, be they biomedical (e.g. genetic testing), technological or more broadly speaking technoscientific (e.g. science weeks). Indeed I am intrigued by the growing importance attributed to science communication both in policy discourse and programs. Furthermore over the last couple of years, I have been involved in diverse expert advisory groups in Brussels in the context of the 6th Framework Programme, in working groups on science and governance and on science in society. And I must confess, that after having just seen the video-message sent by EC Research Commissioner Janos Potočnik to open this conference, I am tempted to integrate an analysis of this message you have seen into my reflections. There are so many implicitly and explicitly expressed assumptions in his presentation – e.g. that intensified and earlier communication will lead to more interest in and implicitly also more acceptance of science – that should not uncritically be taken at face value. The message thus backed my view that it is really essential to also reflect the broader socio-political background when talking about children's university.

Let me now share the two anecdotes with you. Just before one of my lectures at the children's university in Vienna, several hundred children were waiting in front of the lecture hall - many of them with their parents. Waiting too, I listened to the conversations parents had with their children. It is worth to briefly reflect on some of the advice they gave to their kids: Some suggested to take notes, others stressed that they should behave, again other children, when they expressed worries about what to do during the lecture, were advised to simply follow the instructions or to observe what others did and adapt accordingly. And it continued through all kinds of variations, the entire spectrum of what parents say when taking their children to places they identify as special. This puzzled me and made me question what this exercise "going to a lecture on science" actually meant for children and their parents. My first class was scheduled for 1.5 hours in a big amphitheatre and, having a boy who was just a couple of years older than these children, I thought: How will I manage to keep these kids seated and interested in one way or another over such a long period?

The second anecdote takes place in the context of the questions parts of this lecture, which was entitled "What does it mean to be a scientist?". Coming from the field of social studies of science, which aims at understanding the relations between science and society, I thought it would be interesting to reflect with the children how being a scientist has profoundly changed over the decades. By listening to a broad range of smaller story elements the kids should get an intuitive feel of how at any given moment in time the idea of what science can do, should

do and what people doing science should be like was fundamentally different. I intended this to then enable them to break with and question what they get presented as scientists in school books or similar settings: elderly guys often from many centuries back, lonesome heroes, ... Particularly in these contexts, there actually is little reflection that this does by no means match contemporary lives of scientists.¹

I told my story as a travel in time: We started in the 16th century and “visited” a couple of persons in their lives as researchers. To do so I was using power point slides mostly with pictures and a couple of small textual elements. The first slide held the title of my lecture and a couple of pictures generally associated with science and technology. Among them was one really tiny image of a robot in the background – a detail to which I will come back later. I highlighted different elements in the history of being a researcher and when arriving in 19th century science, I made a halt and asked: “What have you observed in my story, was there anything strange or missing?” One girl quite spontaneously raised her hand and said there hadn’t been any women so far. “Well observed”, I answered, “I suppose you talk about these things at home.” She nodded. And I continued explaining that this was an important observation: “We had no women in the story so far. But the interesting thing is that actually there were women doing science, they were just made invisible through the way science works and we tell the official history of science.” And I gave them a couple of concrete examples of outstanding women scientists from these past periods.

My story continued into the 20th century and coming to an end the kids again had the opportunity to ask questions or exchange with me on any other issue. During the talk I had observed a little boy in one of the front rows who had kept his hand up throughout the whole period – yet never wanted to pose a question when addressed. I thought that it was probably more of an exercise of conformity for him. Then came the first question and the kid wanted to know why robots are silver. After a second of astonishment, I thought: “Wow, something with my pedagogical concept had fundamentally not worked out.” And I struggled trying to react to this question in an adequate way, yet having this feeling that I could actually not answer this question. The second question came from a young boy in the first row: “Please, could you explain to me how they made the women invisible?” “I’m sure you have an older sister, don’t you?” was my amused reaction. He confirmed. I spare you my concrete and quite detailed answer that followed about what I meant by “making invisible”.

I left this lecture with mixed feelings. It had been a really nice moment, the kids had really been extraordinarily cooperative given the format and the spatial conditions and they seemed to have enjoyed it globally. But, frankly speaking, I was left also quite puzzled. What I had been trying to tell them and what they had heard, or at least what they wanted to know more about, seemed two quite different stories. Would the take home lesson for me be: take off the robot picture from the first slide and don’t say anymore that “women were made invisible” from science? But besides these more down to earth “learning experiences”, I was starting to wonder what these kinds of settings in which science and society were supposedly meant to talk to each other actually mean – wondering about my own performance, the setting, the kids, the counselling parents,

¹ Just a short side-remark: it took me probably triple the time to prepare this lecture compared to any other class at the university. I had to boil it down many times to something I thought kids between eight and twelve could somehow understand and make sense of.

That was an essential part of the background I would like to speak from. I would like to scrutinize what children's universities actually are: an effort in science communication, a setting where children can do some role-playing exercise or a first step of taming these kids and making them perform science in the right way? In that sense see the following thoughts as a reflection from someone who wants to address the wider socio-political background children's universities are embedded in. I would like to review what such an undertaking means in terms of a broader politics of science and what it tells us about dominant imaginations of the role of science in contemporary society. We had the privilege this morning through Mr. Potočnik's welcome address to get a rather clear impression on policy makers' thoughts concerning science and children and how that fits into a bigger picture. He opened up a number of relevant issues, which to my view would demand further scrutiny. Thus let's start reflecting the broader context of children's universities,² and look at them as being part of a new politics of knowledge and as an expression of the fundamental changes contemporary societies have gone and are going through: a change towards knowledge societies – i.e. societies in which above all scientific knowledge should guide citizens' ways of thinking, living, and making choices in this world. This became nicely visible in Mr. Potočnik's message, stressing that scientific knowledge and innovation are “the future” of European societies, that they are our guarantee for good jobs and good lives. No mention of what is currently happening around us, no single reference to the economically and above all socially difficult times we are going through. We are also reminded in the speech that we live in a highly competitive world, where being the best and moving up in the ranks is central – remember the allusion towards the future Nobel Prize Winners who might be part of those kids coming to children's universities. Indeed everything gets rated and ranked: from universities to schools, from the output produced to yourself as a person performing more or less well – and you have to be among the best to get support; it is all about being well positioned and moving up or remaining high in this new order. There is a lot of public investment in science and technology and people are expected to invest personally in this positioning process through choosing the right education. And scientific knowledge is seen as an important if not *the* essential resource in this positioning process.

Yet, the broader context for children's universities is also a growing market of science communication that has accompanied the growing belief in the knowledge society/economy. Children's universities are not merely an idea, a place of engagement with children, but also a product. A whole market has developed all over Europe, even in those countries being late in intensifying science communication to broader publics. From the political side there is the strong conviction that there is a public unease about science and technology and that the public is an obstacle to realising the above-mentioned techno-scientific future. “*They* are too techno-critic and reject innovations.“; “*They* refuse to eat genetically modified food for irrational reasons.” etc. are often made more or less explicit accusation. Or more generally speaking on the European level there is a frequent complaint about the lack of an innovation-friendly climate that would allow new markets to be opened up more easily. More communication is perceived as a remedy, as there is the implicit assumption that critique and refusal of innovation can only be linked to a lack of understanding of science and technology.

² A disclaimer: I do not assume that necessarily everyone engaged in organising children's universities does so for the same sets of reasons, and indeed motives might vary in important ways. Yet this does not mean that they are not part of a broader political issue concerning science and society.

Yet, the same policy discourse also underlines that unfortunately science communication so far did not deliver the expected outcomes. Thus although we are living in a period where there are more books, TV shows, lectures, museums, etc. on science and technology issues than ever before, this did apparently not fundamentally render the relation between science and society only positive. And although we should know better by now (given the number of studies carried out in this domain) that ambivalence, refusal or simply non-uptake of scientific and technological innovations is not linked to a knowledge deficit, the myth that more communication will improve the situation continues to live on. The main motto thus survives against all experiences: “if people know more about science they will love it, they will build their actions and decisions on it and they will go for it”. Indeed questioning science is seen as something to be “repaired” and much too little reflection is spent on why people in specific contexts do not buy into techno-scientific knowledge or technological developments. In the medical field, to take but one example, we most obviously observe a growing questioning of mainstream medicine which has to struggle with alternative explanatory contexts.

Being part of a larger politics of knowledge, science communication activities have also become increasingly focused on key-publics, with children getting particular attention. Indeed this policy of addressing specific groups in society, which are strategically seen in need to be convinced, is nothing new. If you go back a hundred years it is fascinating to see that one of the key publics for science communication were women – as is also now the case. Investigating the reasons for this focus more closely one quickly realises that it was not so much about giving equal opportunities to women or empowering them. Rather women were seen as having an important reproductive and educational function in a society that was increasingly shaped by science and technology. If one wanted to make society function according to scientific principles women would necessarily have to subscribe to these scientific idea(l)s. Communicating science to female publics in these days should therefore much less be read in the spirit of enlightenment or empowerment, but rather as an effort to support a scientific world model. And in that sense I would also like to question what it means that contemporary European societies have – admittedly to a varying degree – “discovered” children as a preferred audience for science communication.

As a next step it is therefore crucial to reflect our understanding of the basic model of science communication embedded in such initiatives like children’s universities. In principle we could differentiate three models. In the first model science communication is imagined as being about enlightenment (informing people how things are), education (teach them how to act towards and with this scientific knowledge in specific ways) and entertainment (simply enjoy science and technology). The basic assumption underlying this model is that there are clearly defined persons who know (= scientists) and others who have to be taught or entertained. The second model perceives science communication as a kind of laboratory where scientific ideas are tried out in different constellations, thus where technoscientific possibilities are tested for their acceptability in contemporary society. Thus publics invited to this communication exercises are somehow participants in an experiment, defined by those organising the communication. What participants can do is more or less accept what they are offered. And thirdly, science communication could be a space where we *collectively* experiment with the potential relations of science and society. This means that it is not science and technology that define our future, but that a negotiation about this future is necessary and possible. Then participation would get a different meaning, namely defining the conditions under which

engagement with science and technology takes place as much as co-shaping the issues to be addressed.

Having set the stage, now let me share with you a couple of observations concerning children's universities. In doing so I will neither refer to best practice examples nor normative best solutions to more problematic perspectives. And even in the danger of repetition, it seems essential to consider that children's universities are rather different depending on organisers, institutional contexts, participants' background, but also on broader cultural contexts in which they are embedded. I thus will speak from my own experiences, the discussions I had with colleagues involved in such enterprises, but also from the analysis and debates on these issues in the public understanding of science field as well as in policy realm.

The focus on children as audience – and Commissioner Potočnik has made this very explicit – emerges from the worry of policy makers that teenagers increasingly lose their interest in studying science and in selecting research as a career. Actually, this is not true for the sciences in the broader sense of the notion. The worries are related to rather selected areas of science and technology, which have been identified by contemporary policy makers as the key areas for future societies to be built upon. Concretely this means being worried about the lack of engineers, IT people and specialists in some key-fields of the natural sciences. Policy makers actually would care much less if young people would not go into fields like sociology, psychology or any other field in the social sciences or humanities; in fact they would anyway – at least in some countries – rather want less of those students. Yet as students in many countries enjoy free choice of their studies, this freedom all a sudden appears problematic – at least to policy makers. Thus policy makers' concerns are about a lack of *specific* knowledge workers, i.e. people who carry the idea of a knowledge *economy*, and much less about citizens and their lives in knowledge *societies* more broadly speaking.

This explains the special attention directed at children who should be brought closer to science and technology at a rather early moment in their lives. As a consequence they would – so the hope – internalize and appreciate science as a solution provider and imagine these fields for a potential career. As shared myths are a rather strong force structuring and holding together contemporary societies, it seems excellent to embed basic myths around science and its role in society at a rather early stage into young people's ways of thinking and acting. Like that scientific and technological knowledge would become the preferred resource in making choices and decisions, be they individual or collective, private or public. Thus I would argue that addressing kids is not only of interest because they are still curious and open minded and should thus get an opportunity to approach science. It is also because there is a felt need to inscribe science and technology even deeper into young people's minds.

Yet simultaneously an interesting tension becomes visible: most of the time children's universities actually address kids from age 8 to 12 roughly, while generally teenagers seem to lose their interest in science a couple of years later. The most current explanation for this apparent loss of attraction of science is inadequate teaching at school. Yet while this is probably part of the problem, we should also look for other reasons for this loss of attractiveness, which might be embedded in the way research as an activity is pictured in public discourse: competitiveness, excellence, selectivity are not necessarily inviting vocabularies. To illustrate this felt tension between discourse about and reality of research

careers let me use the following two pictures. The first shows the cover of a European report (the so-called Gago Report) stating that “Europe needs more scientists”. This has been a well-rehearsed argument in the EU discourse since the Lisbon Declaration in 2000, where educated manpower has been identified as essential for the realisation of a European knowledge economy. Thus young people are expected to choose certain kinds of science careers; and “brain drain” should be prevented in order for our knowledge economy to develop well. Yet, the second image, taken from an article of the journal “The Scientist”, stages a young Post-doctoral researchers “begging” for a job. It represents a long-standing debate problematising the too large number of highly qualified young people who in the end find no adequate work in research. After having taken the burden of a number of temporal working contracts and having shown high personal commitment (e.g. through mobility), all of a sudden – in the name of excellence – selectivity sets in. Both of these discourses – the one on the need to attract more young people into science and the one on difficult conditions for young researchers – seem to co-exist without critically addressing the respective other. Yet young people are sensitive towards these issues and realise the risks of making a career in science. Thus we should not simply invest into seducing young people to choose science careers and believe that this will solve the manpower issue, but rather reflect why career choices look the way they do and why science seems less attractive. Looking at recent career models that have been implemented in universities – and here I particularly address changes in the Austrian system –, there is good reason to feel ambivalent about recommending a science career to young people. And although I personally feel passionate about research, I am less convinced that we should “sell science” to young people. Communicating research should be seen as an issue of responsibility and ethics. Indeed contemporary research systems have developed in a direction that would need critical scrutiny in particular if we take Mr. Potočnik’s message about the crucial role of science and technology for our future development seriously.

Universities for children thus can be described as having rather different meanings simultaneously. For some it might be simply about science communication, thus they would have the aim to start early on to educate the “scientific citizens” of tomorrow. This would then correspond to one of Mr. Potočnik’s arguments about education and learning. And it would correspond to those parents in my starting anecdote, who instructed their children to take notes and remember the key-issues to be learned. Or is it actually about role-playing, which means learning, rehearsing and exercising how to behave in an institutional setting and how to deal with scientific and technological knowledge in given situations. This would correspond to one parent’s comment, that coming to the children’s university would be good in order to “know how it is when you later go to university”. For these parents the children’s university is thus also about practicing and experiencing “how grown-ups do” at university and thus to appropriate this knowledge space. Finally, children’s universities could be seen as first steps to ‘taming’ the kids. By taming that I try to hint at a “domestication process”, meaning to bringing somebody into an environment that is not necessarily his or her natural one and making the person adapt and behave in a particular way. So it’s about learning the rules, learning how to do things, learning how to behave in a particular way and not in another. This would then correspond to the suggestion of some parents, that their child should simply follow the instruction s/he gets and adapt accordingly

Thus, as any other communication setting children’s universities do not simply transfer adequately presented scientific knowledge and practices, but also give shape and attribute

specific roles to particular audiences. Obviously most of this performative work is not made explicit, but is tacitly embedded into the enterprise. Thus children's universities cannot simply be seen as an answer to a pre-existing need – as Commissioner Potočnik's seemed to allude – but are part of a larger policy imagination which creates a need to which they are the answer. Thus I'm strongly arguing for shifting our attention to the more implicit orderings and normative elements embedded in the concrete communication settings and to the performative side of bringing children into universities, these central institutions of knowledge production and education.

What do children's universities do? An answer to this question could be formulated from at least five different perspectives.

First children tacitly learn what a scientific question is and what not, thus getting a feel of the boundary between what belongs to science and what not. They acquire an understanding where what kinds of questions can be posed and thus implicitly also learn about disciplinary orders at work. This was nicely illustrated by one question I got after my talk at the university for children: why are robots silver? Was it a question to be answered in the context of my presentation? Should I feel competent from my scientific background to formulate an answer? And I did not really give a satisfactory answer for the boy. But above all this little question nicely demonstrates the “non-respect” of disciplinary boundaries children have and the “creative disorder” they introduce with their questions, while at the same time making visible how “organised” or better compartmentalised scientific thinking has become.

Second, children's universities often have a declared aim of showing practices and processes of research. How do scientists handle “scientific objects” and what are they expected and allowed to do? What counts as an adequate way to acquire knowledge? To attract your attention to the normative power of experimental settings often presented in such communication exercises for children, let me share with you an observation coming from the context of a museum for children in Vienna. In one of their recent exhibits on colours they had put in place a little witch house within the museum space with a couple of experimental set-ups in it. Without wanting to go into too many details, I would like to draw our attention to an obvious contradiction built into this setting. While it was set up in a quite playful manner and seemed to be open-ended (as experiments should be) children were nevertheless quite strongly “guided” to do the “right manipulations”. More concretely their efforts were positively sanctioned when the form of behaviour towards the apparatus was seen as adequate, and implicitly classified as a deviant when the form of handling was not seen as adequate. “This is not made for ...”, or “let me show you how to make it work ...” clearly communicated that a child had done something not in an ideal way. In computing, to take another example, a number of studies have hinted at the fact that boys and girls deal with problems to be solved differently. Both find a solution to the problem, but the fact that one way of dealing is positively sanctioned while the other is only seen as yet another potential possibility, makes the message clear. Thus implicitly showing children “how to do science” is a rather strong way of ordering what an adequate way of experimentally addressing a scientific issue is and what is not. In the end settings that look rather open and invite explicitly for dealing with a problem creatively, turn out to be rather normative and a strong ordering force.

Thirdly, we could question whether or not coming to a university for children is actually about acquiring knowledge? So do we think children should after leaving the university know why the sky is blue, or why parents shout at each other, or what it means to be a scientist ... or whatever classes they chose to attend? In fact this seems not to be at the centre, if one browses the web pages of children's universities. And in fact – as I know from the Viennese case – children and parents are even explicitly told that it is not about getting children into the question/answer situation, thus it is not about classical forms of learning. But we should not forget about the reasons why parents bring their children to such undertakings and the messages they get from them, as well as about the fact that children are socialised in school settings and thus knowing answers to standardised questions is often already deeply inscribed into their ways of acting - at least some of them bring the equipment to note down and keep trace of “what they have learned”.

Then maybe, it is – and this is the fourth perspective – about getting acquainted to the institutional setting of a university, about bringing kids into these places and making them feel the symbolic values embedded in such institutional settings. Is it thus also about making them experience how knowledge places are built and how they are ordered? A lecture hall – to take but one example – is something rather unusual for a kid, as schools don't have such spatial settings. Take the auditorium we are in today as an example and look at it as a device for ordering and disciplining all those sitting here. We bring children into such places and teach them to respect norms and rules. We teach them a whole code of conduct through which they then can participate in a role-play of being a student. And even though all this normativity is transmitted in a highly pleasant and playful manner, children quickly understand that these are the rules of the game. They sit there in the ranks and wait, more or less excited about what will be happening “down there”. Thus the setting of such big lecture halls is also about distance, it's about them being “over there” and the lecturer in the centre “over here”, it is – at least in principle – about a clear order between talking and listening. The setting is much less about exchange – even if questions can be posed. It's in many cases about admiration and wonder, in particular when experiments are shown and as one of my colleagues has so nicely put it: this “distance lends enchantment” and thus also creates the (expected) admiration for science.

Or lets take settings like the “laboratory” for children as a second example, which tries to mimic research. We teach children to look through the microscope, to put things into glass tubes and similar manipulations. Thus it is about the practices and materialities of doing research. Outcomes are more or less spectacular, you can reach them in relatively short time and marvel and wonder seem to be part of everyday research work. Yet actually when they later get into a research lab in the course of their actual studies and when they do their first practical work, they will encounter something fundamentally different. Some of them later describe this as a much more “hostile” and unfriendly environment compared to how they got to know it earlier. Lab work often is tiresome, lengthy and full of routines, the moments of intense excitement are rare and it is never clear what the outcome will be. Competition is high and it is much less about the pleasure of knowing for your own sake, but about being the first and publishing in an excellent journal.

Finally, it seems essential to scrutinize how the ways in which kids encounter research/science are conceptualised. One dominant approach is to put in place some hands-on activities, allowing young people to “embody” what it means to do research. Indeed when

looking at the pictorial material that is used to advertise science for kids it is often around fun and entertainment. Hence learning and fun are very much connected and in this a lot of implicit messages can be passed on about science. In a way we then get into a similar contradiction to the one I just mentioned above. Once these children get into university, they are most of the time taught that it is less about fun and enjoyment, but much more about success and failure, about input/output relations and many more.

Let me bring the numerous observations made so far to the point and ask: What do children learn about science, what about research and the institutional settings in which all this takes place?

On the level of *science* they might develop the problematic understanding that there are clear problem-solution packages, i.e. that every experimental set-up has a clear outcome. Actually nobody explicitly claims that, but the fact that we show demonstrations or let them do demonstrations often disguised as experiments tacitly creates this understanding. A demonstration is a setting in which the outcome is known and can be repeated ad infinitum, while an experiment always has an open outcome. Research advances through experiments and demonstrations are simply controlled repetitions. Thus what children implicitly learn – i.e. that experiments have predictable outcomes – has actually little in common with the reality of research. Thus children rehearse a rather positivist vision of science: There is a problem and science has the solution. And it works so well because such a way of approaching science is seductive and children have fun in engaging with it. The researcher thus becomes more like a wizard who can repeat the trick as many times as he wants.

What do children tacitly learn about *research*? First there is, as in most science communication enterprises, a complete lack of any real-time dimension of research. There is a question, there is an experiment that lasts a couple of minutes, and there is an answer. This is the same when you look at popular films. It's amazing how time is shrunk into a moment while at the same time politically you want to make people understand that they should invest several hundreds of millions of Euro over decades into single big experiment. How do these messages go together if you are not a scientist yourself and know how things actually work? The way science is sold to the outside thus has little to do with the actual processes and ways research works. Or, to take a second example, children learn the disciplining character of technologies and protocols. "The technology" tells you what you can do and what you not. The children get the message and simply mimic the requested behaviour and perform the expected manipulations. Finally, the way science is brought to them is much less technologically mediated as it is in the reality of contemporary research. Children still "see" their results and outcomes in a rather direct way, while research today is highly mediated and requires complex technological transformation and translation processes in order to get access to phenomena to be observed.

Finally, what do children tacitly learn about the *institutions* of science, the universities? University is a school with slightly different rules, a better school, a funnier school, a more open school, a more disorganised school? A place where they are taken care of, where time is given to them as "students"? In many cases this time is not given to them in the same contexts in school environments and probably will not be given to them once they enter the university as "real students". But it also creates an interesting kind of consumerism that is built into the

model of children's universities as I know it. Learning is (staged as) a limited good. "I got a place" in this or that course or "I would have like to" get into this or that class, but there was no place left – that's the kinds of conversation I witnessed amongst each other and amongst parents. They are asked to assess the classes they get, thus they can express if the lecture/the seminar fulfilled their expectations. And it's about collecting, be it stamps on a card for participating in a class, or the diploma they get in the end, whatever. It is about validating your having been there. This means that the university for children is not an open space, but that we early on teach them a set of values embedded into education and into the institutions of research and teaching.

Before coming to my conclusions, I would like to shortly also draw your attention to the role of parents and sometimes school-teachers in all this. Parents take their children there and we know that the majority of them has a quite highly educated background. In many ways they see the children's university as giving their child a competitive advantage - to get into a higher education system early on, a system that is very hard, where the competition is felt to be higher and higher; and all this at a time where good jobs get more scarce. You start bringing your children into these different educational lanes to give them an advantage. In that sense parents are important addressees. Thus we have to be aware that new forms of divides appear and existing ones are reinforced. We observe a strong reproduction of the educational gap. I know that there are numerous efforts being made to do something about that in children's universities, but it's challenge that remains.

In conclusion I would like to get back to my initial questions: are children's universities about science communication, a role-playing game or a first step of being tamed? My answer will not be an either/or. In fact all these processes happen at the same time, in different combinations and it is by no means easy to keep control over them. It would need consideration of the contexts children come from, of how they encounter science, research and learning in these contexts, of how they implicitly or explicitly accommodate, resist and position themselves. And I think that differs a lot depending on the social position children come from as well as on the broader cultural context such enterprises are embedded in.

This is why I essentially argue that organisers and policy makers should reflect the more tacit assumptions why children's universities are and should be taking place? What is actually happening there?, should be the essential question. What orders, norms and values are tacitly embedded in the very way of performing children's universities? In that sense we should not discuss children's universities as an abstract concept of, but should be reflecting the way they are practically carried out. Thinking from a more political perspective, we would thus have to ask ourselves about the society of tomorrow for which we "prepare" these children. And suddenly the issue for children's universities would no longer be to "repair" an apparent disinterest of children in science. If we actually believe in the curiosity and creativity of these children as a central resource for our societies of tomorrow, then why do we not build school and university systems which are no longer degree-attributing machineries? Children's universities can never be a remedy for a partly dysfunctional system. Maybe more young people get interested in science through such initiatives and might even choose to go into universities and follow a career in science, but at the same time many of them will leave disappointed, as they in actual practice often will not find any resemblance with the presented image of the institution that made them come.

And finally, children's universities do not only address issues of science and research. Implicitly they also perform models of science and society. Children also learn about what science can do and what not and what it does for a society. In that sense it would be essential to teach kids also the limitations science and research have and how complex these interactions are, not on an abstract level, but bringing that into the way we mediate science, work with and talk to them. In that sense I consider children's universities as also being part of a whole new politics of knowledge and we should thus also pose the question of the responsibility of children's universities in building tomorrow's societies.

Thank you very much!

Q: Before my inner eye I see the picture of a child, a child of middle class with reasonably well-educated parents who want the child to go to university. I see another picture of another child whose parents have suffered from education, for whom education has not added any value and who tell the child: "University is not a place for you." The children's universities in England are about giving people the confidence to look out the window and, in a sense, giving the people the confidence to be a little bit more empowered to make decisions. I wondered if there are tensions there that you see.

A: Institutions have quite high barriers in the sense that imagining that going to university is a possibility needs work to be done throughout many years. What is the kind of horizon you see as a teenager, that seems in reach? I was very careful not speak for other children's universities globally, as we have to consider specific contexts and cultures. You might be right that opening the institution university to children improves their chances, yet I am wondering how sustainable changes through such short-term encounters are. If schools don't do this kind of work, I am hesitant to believe that children's university can compensate with once a year events – if children come back at all. That's my first point.

My second point is: From which kinds of social backgrounds do kids participating in children's universities come? In fact what I experienced most of them came from middle class and upwards, where children already have a certain habitus. They would say: "My mother is also a teacher at the university" or similar things – they are confident that the university can become their place. That makes a big difference in the way they behave and move in the context. To a certain extent going to these events for kids provides them with additional advantages. They find it funny and amusing, they share this experience with other kids. Yet they meet a much more friendly university, a much more welcoming institution than when they will start studying at the age of 18.

Having said all this I wonder how a concept for children's university would look like where you address children from disadvantaged social backgrounds. You have probably all made some sort of survey or statistics of the things you have organised, but the statistics I know roughly reproduce the educational divide in a rather strong manner. The dominant majority has either highly educated parents or parents thinking that education is essential to have a better life. But we don't get the social segment with low formal education and weak economic background.

Q: Systematically, in the UK we are rolling out universities with a different agenda, with a widening participation agenda. Now I see the opportunity to get those two agendas together as exceptionally powerful because we have already got the vehicle to get into the schools, to get the young people very targeted usually by school level because particularly at primary school level, you look at indicators of multiple declaration – whatever you can actually target by school. So we have these two initiatives, namely children's universities and the widening participation agendas, and can get those together. The trouble with universities is it's populated by people who are successes of that system. So at the same time you have also got to have a parallel process of institutional change.

A: Yes, there is a challenge in the way children's universities are performed. In the British case seems interesting how the university system gets reflected in the children's universities. It's different in the case of Austria, I would argue. First Austria started amazingly late with science and technology outreach activities compared to other European countries. In the British case you have along history of different forms and formats of science communication, like open university movements already in the late 19th century. Vienna was also very strong in early 20th century with the popular university movement, but WWI and the breakdown of the Empire caused also a rupture in this tradition, with activities only starting in the 1990s. Although there was a strong political discourse that universities should be opened to people from working class background, this never worked in the imagined way. Indeed universities are not open because you declare them as being open. Opening up education is a continuous work to be done, and institutions would need to perform differently.

Q: We tried this at Frankfurt University. We tried to get in contact with schools. We have every subject three times a day, the first and second lessons are only for the schools. If you have a look at the children coming there, there are a lot of children with immigration backgrounds. We have the chance to get into contact with these children as well. I think it's a good opportunity not only to inform the parents but also have the teachers with you.

A: I think this is important, but the issue is nevertheless more complicated. Even if you get them there: What else is needed, besides getting them once into this university, to make them believe that this is a place for them to be in and to contribute to? We can see similar things when children go to the museum with their teachers. The teachers are telling them what to do and what not to do, what they see and how they should see. After all it's often an extended class-room experience; it's a nice outing. You could argue: "That's exactly what we want!" and I respect that, it's a possible model. But we don't know what the impacts then actually are. It might happen that they still feel more excluded, or even more alienated. Studies of adults being confronted with science show that a lot of them express feelings such as: "I will never be able to catch up with that!" and just buy out of it. We don't know if bringing them into the institution university leads automatically to an empowerment and allows them to imagine staying in the system. They might also feel that this is anyway not a place they are suitable for. And in the end they have come here because their teacher told them. As you may see I am less convinced of the linear chain model implicitly presented by Potočnik this morning: If we get more children into universities, then we get more Nobel Prize winners and keener scientist in the end.

My own story tells me something interesting: As a little girl I went to the technical museum with my father because I found this the most fascinating place. And he took me there even though he probably thought I was nuts – and he never entered with me. And I suppose over the years I built this idea about science being the greatest thing to do. I went to university and the disappointment was programmed. I did my studies, never had any problems, finished my PhD and realised that's definitely not what I wanted to do the rest of my life. I was still interested in science, fascinated by the different developments, but the way it worked in the everyday context just was not what I expected and what satisfied me. Maybe my expectations were too high, I had this idea from all those stories you get told, about this fascination, about having something new every day, That's why I feel a bit uneasy about this seduction game. It's about whether we can keep the promises we make to these kids. Will we be there for them once they come as young adults, will we still tell them that they are our future and care for them? Or will we pack them into lecture halls in all too great numbers, will we try to be as selective as possible and tell those who don't get the first hurdles to leave? We tell them: Why the hell did you want to study psychology or sociology or history, if society needs engineers! And now to top it all, we're keen on women in engineering because men don't want to go there anymore. What is the message? I'm sorry for being polemic.

Q: We are thinking about overcoming stereotypes, and you were talking about strengthening stereotypes in some way. So children's universities somehow strengthen stereotypes. Would you say we should stop our activities?

A: There is no reason why I should suggest this radical turn. I was simply trying to draw your attention to the need to more carefully reflect the implicit values and imaginations embedded in the activities of children's universities. Projects like that are always work-in-progress, there is never one very best way to do it and one never knows where it exactly leads to. Children's universities have existed for a couple of years and you have made experiences with them. Thus I believe it is essential to be reflexive and rethink them both as an activity for children but also as a political activity. That's why I was arguing in the beginning to rethink Commissioner Potočnik's talk. Identify the messages, reflect the political expectations embedded in them and do not buy into sometimes quite simplistic promissory discourses concerning the capacity of children's universities. Maybe we should not make too wide reaching promises to young people that we are sure we cannot live up to. I think children's universities are an interesting way to get in touch with children, but maybe they are not a way to make the educational system more fair, maybe they even on the contrary reinforce existing divides. Thus it seems essential to admit the implicit politics of such undertakings, and let's make more explicit what they are. Thus my critical reflections were not meant to suggest that we should stop doing children's universities, but let's be more aware about the political economy they are part of, reflect what parents expect when they bring their children there and why we all of a sudden invest into young people to make them choose science as a career. Maybe we should much more not only tell children what science is all about, but also listen to them and watch the settings in which creativity can happen. That was my point mainly.